

Dental

Abstracts

a selection of world dental literature

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Dental

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Abstracts

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AMERICAN DENTAL ASSOCIATION

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**Dental
Abstracts
has
these
purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
2. *To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
3. *To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Preventive and public health dentistry



Caries etiology and control

Development of caries and xerostomia in animal experiments (Kariesentstehung bei experimenteller Xerostomie)

F. Rozeik. *Zahnärztl.Reform* 56:458-461
Dec. 1955

When roentgen rays or radium are used to treat malignant tumors of the mouth, xerostomia frequently occurs, accompanied by severe damage to the teeth. In dental literature, this condition is termed aptyalia or "florid" caries (Bartley; Hutchinson and Hadden, and Seifert).

At the Dental Institute of the University of Mainz, Germany, an experiment with 55 albino



Figure 1 The right half of the mandible (Group 2) and an enlargement of an area

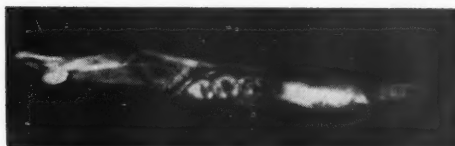


Figure 2 The left half of the mandible (Group 3) and an enlargement of an area

rats has been carried out to establish whether xerostomia can be produced by surgical extirpation of the salivary glands.

The rats were divided into seven groups: In nine rats (Group 1), the salivary glands were removed and the animals were fed a cariogenic diet; in nine rats (Group 2), the salivary glands were extirpated, but the rats received a normal diet; in nine rats (Group 3) which had been fed a cariogenic diet for seven generations, the salivary glands were removed, and subsequently only cariogenic food was given; in four rats (Group 4), only the right salivary glands were extirpated, and a cariogenic diet given. As control animals to Groups 1 and 4, ten rats (Group 5) were not operated on, but received a cariogenic diet; as control animals to Group 2, ten rats (Group 6) were not operated on, and were kept on a normal diet; and as control animals to Group 3, four rats (Group 7), were not operated on but received cariogenic food.

The cariogenic food was prepared according to Shaw. The normal diet consisted of 75 per cent barley and 25 per cent fish meal.

After the operation, the animals of the different groups received the diet as indicated and supplies of fresh drinking water for either 145 or 175 days. All the animals were then sacrificed.

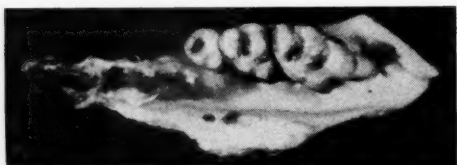


Figure 3 The right half of the upper jaw (Group 5) and an enlargement of an area

In all rats subjected to operation, xerostomia occurred. The teeth were covered with tartar because of the lack of saliva and its cleansing effect. The gingival margins were thickened and showed the symptoms of gingivitis. The jaws were then dissected and investigated under the binocular microscope enlarged tenfold, to determine whether caries had been produced. It was established that the animals of Groups 1, 2, 3 and 4 showed a higher degree of caries frequency than the control animals. These carious lesions, however, differed from lesions appearing after roentgenization or radiumization.

The result seems to indicate that xerostomia alone does not cause caries but that intensive roentgenization or radiumization may cause both xerostomia and dental caries.

Dental caries

H. H. Neumann. *J.A.M.A.* 161:119 May 6, 1956

The role of heredity in regard to caries is often overestimated, as shown by the sharp reduction of caries in children of Northern Europe during and after the war years, and by the commonly seen rapid disintegration of the almost perfect

teeth of primitive people if they change from their "natural" foods to a "refined" diet.

Surprisingly, canned peas and corn are found on a list of foods to be avoided by the caries-susceptible child. Indians in the highlands of Mexico may derive over 70 per cent of their caloric intake from corn, ground or unground, yet they have admirable dentitions, with hardly any caries.

As many primitive people with good teeth live on high carbohydrate diets, often including simple sugars, the crucial question is: "What accounts for the different effects on the teeth of natural and refined foods?"

The author, who has worked among many isolated tribes with excellent teeth, ascribes the protective effect of a "natural" diet to a biophysical rather than to a biochemical factor.

"Leave the thigh of a child without the pressure of supporting the body, by keeping the child in bed, and the structure of the femur will undergo a rapid change. The low loads of refined soft diets alter, in my view, the molecular structure of the teeth and render them susceptible to the attacking agents in the mouth. . . . Rather than trying to avoid almost unavoidable bacteria and carbohydrates in the mouth, I recommend encouraging children to chew hard substances, such as the toughest available bread crusts, harder types of cereals as shredded wheat or toasted corn, or the hardest gums available."

Incidence of caries in Latin America

(Zur Frage der Verbreitung
der Karies in Lateinamerika)

Ernesto Cohn, Puebla, Mexico.

Deut.zahnärztl.Zschr. 11:150-152 Feb. 1, 1956

Although caries is a world-wide dental problem, the European dental literature seems to be interested only in the alarming increase of caries observed in most European countries, especially in Central Europe.

The prevailing confusion as to the etiology of caries and the unexplained or unexplainable increase in caries frequency probably originate from the attempts to demonstrate that both phenomena stem from nutritional causes. The differ-

ence in caries incidence among different groups of the population in various countries, however, makes it difficult to believe in the value of the all-explaining nutrition theories.

In Latin America, caries and the increase in caries frequency seem to play a minor part in dental literature. In most South American countries, caries is steadily increasing. In Argentina, Bolivia and Ecuador, this acceleration is alarming.

In Central America, especially Mexico, caries also is increasing, although not at such an erratic pace as in the countries of the "old" continent.

The same rate of caries increase is not observable in all population groups. Negroes enjoy a healthier dental condition, although the standard of oral hygiene is low. Premature destruction of deciduous and permanent teeth because of caries occurs in native Indians, half-breeds and also in many white immigrants. The dental condition in these groups does not differ from that of Europeans.

In Argentina, there are few Indians left. The white population, mainly Spaniards, Italians and Germans, has the same caries frequency as has been observed in Spain, Italy and Germany.

The other South and Central American countries have large numbers of Indians and mestizos. Negroes and mulattoes live concentrated in the coastal regions. Ecuador has a large Negro population, but Mexico, in spite of its closeness to Cuba and the Antilles, has a comparatively small Negro population.

The caries incidence does not seem to be dependent solely on the diversity of racial groups. Economic factors play an important part. The tropical and subtropical climate affects the development of the human organism and therefore that of the dentition. In higher altitudes, the different climate influences the nutrition. Dobkowsky reports that people living in the high Andes have a lower caries frequency than those living in coastal and central areas. Mountain tribes which eat hard food exclusively have a low caries frequency.

The dental condition of Mexicans does not differ from that of other Latin Americans. The population of the mountainous region has a healthier dental condition than that which is observed in subtropical and tropical areas.

In Latin America, the increase in caries unquestionably has been caused or promoted by economic changes occurring since the end of World War II. For more than a decade, a severe economic crisis prevailed, accompanied by inflation and a general impoverishment. An unexplainable, surprising change in nutrition occurred simultaneously. A switch from the previously wholesome diet to an enormous consumption of sugar and sugar products was observed. Fresh fruits now are rarely consumed, and a change from coarse corn products (tortillas) to fine wheat products has taken place. The consumption of meat has increased and that of fish, decreased.

Fluorine prophylaxis and drinking water fluoridation do not receive the same attention in Latin America as in the United States or Europe. The Latin American dentists avoid discussions of problems for which they see no immediate solution.

The Province of Puebla in Mexico seems to be the first to have opened public dental (orthodontic and pedodontic) clinics. The Public Health Authorities of the other Mexican provinces (and those of the other Latin American countries) are more interested in the fight against leprosy, malaria and yellow fever than in the caries problem.

Study of caries experience rates of six-year-old children of Milan, Tennessee, after five years of fluoridation

A. H. Trithart and Robert P. Denney.

J. Tennessee D.A. 36:156-159 April 1956

Dentists, physicians and city officials of Milan were sufficiently impressed by the Newburgh-Kingston fluoridation study published in 1949 to petition the town's Department of Public Utilities to fluoridate the public water system. The aldermen unanimously passed an ordinance enabling the City of Milan to fluoridate its water supply. Before the plan could be achieved, the Public Health Council of the Tennessee Department of Public Health had to adopt a policy concerning the fluoridation of public water supplies, and the Division of Sanitary Engineering of the Tennessee Department of Public Health had to develop standards and requirements for adding fluorides to public water supplies. The policies and stand-

ards adopted for the City of Milan in 1951 have become standard for the subsequent fluoridation of 25 additional municipal water supplies in Tennessee.

The City of Milan is presently supplying an average of 700,000 gallons of fluoridated water a day to about 7,000 citizens, at a cost of \$1.30 a day for fluoridation.

The effects of fluoridation on the caries experience of six year old Milan children after five years of continuous fluoridation are described. The dental caries experience of Milan children in February 1951 and in February 1956 are compared. The caries experience of six year old Milan children in February 1956 is also compared with that of six year old children in Trenton and Humboldt, two communities where the water supplies are practically fluoride free.

The def rate in Milan was 47 per cent lower than in Trenton and 36 per cent lower than in Humboldt.

Six year old children in Milan in February 1956 had a DMF rate 57 per cent less than in Milan in 1951 and 62 per cent less than in Humboldt and 70 per cent less than in Trenton in 1956.

In 1956 four times as many Milan children had no caries experience as Trenton children, and five times as many Milan children were without caries experience as Humboldt children.

Special vehicle to haul germ-free laboratory animals for science

Transport Topics No.1079:10 April 16, 1956

The first vehicle in history for transporting germ-free animals will be built by Studebaker for the Lobund Institute of the University of Notre Dame. The vehicle will provide transportation for the experimental animals from the institute, in South Bend, Ind., to laboratories within 1,000 miles. Until now, scientists wishing to use these animals have had to use the facilities at Lobund. Germ-free animals are important for medical and biologic research on the problems of tooth decay, radiation sickness, cancer and the aging process.

Animals to be shipped include rats, dogs and monkeys. Each animal will be shipped in a closed cage provided with fiber glass air filters. The spe-

cial vehicle will provide a constant supply of temperature and humidity controlled air in the vehicle, and a separate supply under pressure to the germ-free compartment through a second set of fiber glass filters. An air exhaust system will prevent excessive moisture condensation.

Germ-free animals for research are obtained from the mother before birth. The infant creature is placed in a sterile tank where the air it breathes is filtered and sterilized. Temperature and humidity are maintained at constant levels. Food and water are sterilized by steam. Men working with the animals must either handle them with sterile rubber gloves, or be covered by an airtight suit with an air supply separated from the air breathed by the animals.

Dental caries of the first molars and the age of children when first consuming naturally fluoridated water

R. M. Grainger and C. I. Coburn.

Canad.J.Pub.Health 46:347-354 Sept. 1955

Weaver studied the first permanent molar teeth of children who were born in a naturally fluoridated region and compared them to those of children moving into the region at various ages. He stated: "The DMF first molar teeth did not differ as between the natives and those who entered the fluoride area at age 5 or less, but in all the other age groups the rate was lower in the natives. . . . Evidence obtained is on the whole in favor of the view that the influence of the fluorine is exerted on the teeth during the pre-eruptive period." A study was undertaken to confirm the general observations of Weaver and to discover if the critical time of introducing fluorides was similar for pitted and for smooth surface caries.

The average accumulated caries scores on surfaces of the deciduous and the permanent first molars were related to the age of 700 children on moving into the fluoride endemic regions of Aylmer and South Dorchester, Ontario. Aylmer has had 1.2 ppm of fluoride in its deep well water supply since 1934, and the private wells of South Dorchester contain fluoride in varying amounts.

The existence of the difference in the caries susceptibility by residence groups has been con-

firmed for permanent first molars. The caries rates on pitted surfaces, but less distinctly on the smooth surfaces of the first permanent molars, could be divided roughly into two levels representing the children who arrived in the fluoride region before or after the eruption of the teeth. There is apparently no important increase in the caries susceptibility of migrants over native-born children for those arriving up to their fifth birthday. Indeed, the migrant children arriving at age three years seem, if anything, to be less susceptible than the native-born children.

Although the graphic array of means for deciduous teeth suggested that there was a similar protection to the teeth of children born in the region, or who arrived before their second birthday, the difference was not significant. This indicates that the protection to deciduous teeth may be less than to permanent teeth.

It is inferred that if fluoride is to give protection to a tooth it must be introduced before the final maturation of the enamel begins, or about one year before tooth eruption. There is little or no indication that the earlier introduction of fluoride during amelogenesis is of added benefit. Individuals migrating into a fluoride endemic region or beginning to ingest fluoridated water may expect reduced caries susceptibility for those teeth which erupt after a few months' consumption of fluoridated water.

Most of the caries on the first permanent molar occurs in the occlusal grooves and in the buccal or lingual pits. The study of these areas which decay in spite of fluoridation may lead to the discovery of factors to complement caries control by water fluoridation.

A new approach to dentifrices

Albert Schatz, Joseph J. Martin, Karl E. Karlson and Vivian Schatz. *New York D.J.* 22:161-173 April 1956

For almost a century the acid factor in caries etiology has dominated thinking and research. Most present-day dentifrices are based on the acidogenic theory. They are formulated to inhibit growth of acidogenic bacteria, prevent acidogenesis and neutralize fermentation acids.

Seven current commercial dentifrices were tested in experiments carried out in the Warburg respirometer with mixed cultures of oral microflora grown in an agitated hair, wool and feather mineral medium inoculated with human saliva. Further growth experiments with a saliva inoculum showed that the seven dentifrices effectively inhibited acidogenic bacteria in a sugar medium but allowed luxuriant development of proteolytic microflora on peptone, gelatin and meat extract.

The experimental results showed that water-soluble constituents of dentifrices claimed to be effective against acid-producing bacteria are not inhibitive to oral keratinolytic microflora. On the contrary, keratin-digesting organisms utilize dentifrice products by oxidizing them as sources of energy. The value of alkalinity, ammonia and urea in dentifrices is questioned, because these very factors have been shown to make the enamel organic matrix more susceptible to attack by oral keratin-degrading protista.

To date, most attention has been concentrated on the effects of dentifrices on the mineral components of enamel, whereas the organic matrix has generally been overlooked. The enamel organic matrix must be considered, however, if the adverse effects as well as the efficacy of dentifrices is to be determined.

The experiments show that dentifrices do not counteract but rather appear to enhance the activity of oral keratinolytic microorganisms under *in vitro* laboratory conditions. Even from the clinical point of view, present-day dentifrices are not decreasing the incidence of dental caries. From another point of view, no adequate laboratory test for caries susceptibility has yet been developed on the basis of the acidogenic theory. Perhaps the investigation of oral keratinolytic microflora will contribute toward an understanding of the role of proteolysis in the etiology and prevention of dental caries, and will allow the development of a satisfactory test for caries susceptibility.

Largely because of the "weight" of the acidogenic theory, the enamel organic matrix was for some time viewed as nonexistent or insignificant. Both the enamel matrix and its importance, however, are now accepted, and its susceptibility to attack by oral protista has been established. Furthermore, the proteolysis-chelation theory now provides a biological explanation for the etiology

of dental caries. As a result, there is no longer any necessity to consider acid as a decalcifying agent. From this perspective, horizons can be seen beyond which the solution to the problem may lie.



Statistical research

The development of caries indexes

(K vývoji indexu kazivosti)

V. Poncová. *Česk.stomat.* 5:1-22 March 1956

One of the most important problems in present-day dentistry is the statistical determination of caries incidence in both individuals and groups. It is necessary to develop and utilize uniform standards and procedures in clinical and statistical studies of dental caries. In recent years there has been a remarkable increase in the number of tests of the effectiveness of agents developed for caries control and prevention. Many of these tests, however, have been inadequately designed, executed and reported, and the comparison and evaluation has been either difficult or meaningless.

Various caries indexes such as DMF, def, MD and OE, or those used in Europe, KPE, CER and KEG, show wide variations. The DMFS index seems to have the greatest uniformity in per cent difference figures, and the DMFT index the least uniformity. The MD index shows the greatest percentage difference in reduction of caries increment of all indexes used. Such an inadequacy probably is caused by an insufficient evaluation of previously extracted or crowned teeth which could have been either carious or noncarious. Many of these extractions were made for orthodontic or prosthodontic reasons or were necessitated by periodontal diseases. Not all teeth with crowns, pivot teeth, fixation splints, extension wires, or those serving as abutment or anchorage for partial dentures have carious defects.

The Czechoslovakian caries index (Poncová, Novák and Matěna) is mainly used to compare caries experience in one group with that of other groups with a similar population density but liv-

ing in different environments. In this index, the "variables" seem to be controlled. In all examinations, studies and tests in which this index is used, the average number of teeth, tooth surfaces and tooth areas and the condition of previously extracted or crowned teeth were considered.

Of 4,645 teeth recently examined, about 80 per cent were carious. Only 67 per cent of crowned teeth serving as anchorage for partial dentures showed carious lesions. Isolated crowned teeth, however, showed a caries incidence of 95 per cent.

The following formula served as a basis for the caries index (in adults):

$$\frac{1 - C - FC - 4/5 E - 2/3 AT}{\text{base}}$$

(C — caries; FC — fillings and crowns; E — extractions, and AT anchorage teeth).

The proposed formula can be applied as a basis for an individual or a collective index. In individual examinations, the base is given by the amount of teeth in the adult dentition (32), and in collective studies, the number of persons examined must be multiplied by 32 to establish the correct base figure. The average index value then will lie between 0 and 1. The nearer the index number is to 1, the higher is the caries frequency.



Public health dentistry

Orthodontics and public health dentistry

(Soziale Kieferorthopädie)

Ch. F. L. Nord, Amsterdam, Netherlands.

Fortschr.Kieferorthop. 16:103-105, 1955

Severe dental anomalies occur so often that a further increase can only be checked by immediate measures on the part of the dental public health authorities.

Only by the utilization of simple but effective procedures can such a service be economically sound and effective.

Orthodontic specialists, however, will never be able to take care of the increasing number of patients. In smaller communities orthodontic prac-

tice is unknown or has many disadvantages. Dental practitioners should receive instruction so that they are able to diagnose and treat patients with uncomplicated dental anomalies.

Present knowledge already makes it possible to prevent severe dental anomalies by treating children in their early years. Every dentist can easily obtain knowledge adequate for uncomplicated orthodontic treatment.

The solution of this problem consists in the organization of courses in larger cities where an abundance of patients permits the dentist who is more or less inexperienced in orthodontics to become familiar with most orthodontic methods.

Until recently, the activity of the oral musculature, or the insufficiency of the orbicularis oris which influences not only the esthetic result of orthodontic therapy but often produces relapses, has been neglected.

Greater cooperation between pedodontist, orthodontist and rhinologist is necessary. By more intensive propaganda, public health dentistry can achieve the desired result.

The knowledge and experience of the public school dentist must be increased. The dental public health authorities should enable the school dentist to obtain a temporary assignment as an orthodontic assistant in hospitals or dental institutes where he can learn to distinguish between conditions which he can treat himself and those which he must refer to a specialist.

The correct practice of orthodontics consists of: (1) observation of the development of jaws and teeth in children of all ages; (2) evaluation as to whether anomalies of the deciduous dentition have been caused by exogenous factors; (3) understanding that the majority of conditions are not difficult to treat; (4) comprehension that anomalies caused by endogenous factors always should be treated by specialists, and (5) timely management (early treatment) so that occlusion of the deciduous dentition during the changing period is and stays normal.

A difficulty occurs with Angle's Class I anomalies in which inadequate space for erupting permanent teeth exists. This necessary space, however, can be obtained by extracting the neighboring deciduous teeth. The problem, however, is not solved by such extractions; periodic observation is necessary. Recent experiences reveal

that the extraction of the lower bicuspid involves a greater risk than that of the upper bicuspid. Here, Spee's curve must be taken into consideration.

Differences in the size and shape of the teeth also can produce anomalies. Often, extraction of a lower incisor brings correction. Such an extraction is justified by esthetic effects and by the improved masticatory function.

By including orthodontics in the activities of public health dentistry, many young patients can be helped who otherwise are harmed, sometimes for their entire lives, by failure to receive the orthodontic treatment needed.

Pedodontics in Canton Valais, Switzerland (Schulzahnpflege im Schweizer Kanton Wallis)

Ch. Böhne. *Zahnärztl. Praxis* 8:6 Feb. 15, 1956

Recently the health authorities of the small Swiss Canton Valais (Wallis) took an important step toward improving the dental condition of pre-school and school children. Most of the inhabitants of this canton live in a high mountainous region, and the few dentists reside in the towns of the Rhone valley.

The dental condition of the people in Canton Valais is poor. The diet consists of comparatively high amounts of sugar, pastries, wheat bread and canned goods of an inferior quality, and small amounts of fresh fruits, meat and fish. Oral hygiene is hardly practiced, and many children do not know what a toothbrush is or its purpose.

Of 6,000 children examined, 78 per cent have carious deciduous teeth, and 54 per cent carious permanent teeth.

With the support of the World Health Organization, the Swiss Health Authority and the local health associations, mobile pedodontic units, devoted exclusively to the treatment of children living in the mountainous districts, were introduced. The dentists serving in these mobile units advise parents and teachers to bring the children for periodic examination and treatment according to a previously published schedule. Despite the fact that almost 80 per cent of the children needed immediate dental treatment, only about 5 per cent visited the mobile units during the

first round trip. The reason for such a negative attitude probably lies in the parents' and children's opinion that the mobile pedodontic units were "shows on wheels," and that the cost of dental treatment would be beyond their means.

The financial state of the local health associations made it impossible to maintain dental clinics in schools or hospitals or to contribute toward the maintenance of the mobile unit service.

The World Health Organization, however, contributed toward the creation and maintenance of this essential service and hired a Norwegian dentist, experienced in Norway's mobile pedodontic unit service which has achieved great success since 1935, to take charge of the pedodontic activities in Canton Valais.

Each of the Swiss mobile units consists of a waiting room and an operatory with modern equipment. It also contains a library, a radio and a record player.

Now, these "tooth buses" are welcomed and are visited by the children whenever and wherever they arrive.



Dental health education

Tooth paste miracles—or frauds

Joseph J. Seldin. *Progressive* 20:23-25
Jan. 1956

From the time of the early Egyptians mankind has experimented with a diverse array of dentifrices. But the sales of dentifrices did not really blossom until the current century in the United States, where the communication and transportation systems were developed sufficiently to open up mass markets for commercial products.

The big soap companies—Colgate-Palmolive, Lever Brothers, and Procter and Gamble—had accumulated large fortunes by merchandising soap to the mass market. They recognized an opportunity to enter the dentifrice field, and applied its soap merchandising methods to the selling of

dentifrices. They poured millions of dollars of their soap profits into their promotion campaigns for dentifrices. In a few years they led the drug companies in dentifrice sales, with 70 per cent of the volume.

The big dentifrice companies have played fast and loose with therapeutic claims. Since the 1920's they have marketed dentifrices on claims that the dentifrices would do away with mouth ailments by a process of "detoxication"; that the dentifrice was composed of synthetic saliva; that a dental cream had "special film removing qualities"; that the dentifrice could make teeth "three shades whiter in three days"; that it could remove "seven kinds of stain"; that it corrected "pink toothbrush"; that it "neutralized acidity by releasing oxygen and lime water"; that it contained "a strange, almost magical ingredient that cleans the teeth in a new, safe, delightful way"; that its ammoniated quality inhibited bacteria and neutralized decay-causing acids; that the chlorophyll in a dentifrice would abolish mouth odor; that an antienzyme quality would inhibit the formation of mouth acid, and so forth.

The American Dental Association has protested continually against the never-ending series of anticariogenic dentifrices that appear on the horizon like meteors, blaze momentarily, and then burst and drop into oblivion.

Today the dentifrice manufacturers are parading their latest miracle dentifrice, one that contains fluorides.

The fact that prolonged research shows that virtually the only effective way to use fluorides against tooth decay is by fluoridation of public water seems to the dentifrice manufacturers to be a needless scientific restriction. A torrent of ballyhooed promises is pouring forth from television, radio and newspapers that the new fluoridated tooth pastes can "save your teeth from decay."

The Federal Trade Commission, which has demanded that the tobacco industry accept an advertising code eschewing the claim that cigarette smoking is not harmful, should confront the dentifrice industry with a demand that it cease its inaccurate and untruthful claims in advertising.

Professional activities



Practice administration

The photography of work trays

George L. Jackson. *D. Radiog. & Photog.*
28:68-71 Oct. 1955

The work-tray system makes the work of the dentist easier by making it unnecessary for him to spend time away from his patients getting instruments or materials not on the bracket table, or waiting for the assistant to bring such instruments. Photography helps the dentist realize the benefits of the work-tray system by making it easy to train new personnel.

When the dentist is prepared in advance for each patient, with instruments and supplies always within reach, he can work without irritating delays.

The work-tray system is simple. Before dismissing the patient, the dentist notes what he will do on the patient's next visit. Each afternoon the dental assistant studies the next day's appointment list and records, and makes up a tray for each patient. On each tray are placed all the

items needed for the indicated work. The trays are racked up as they are finished. Just before the patient is due, the assistant places the patient's tray on the bracket table in the scheduled operating room. With this system, the dentist never has to wait for instruments to be sterilized, or go to a cabinet for them, one at a time.

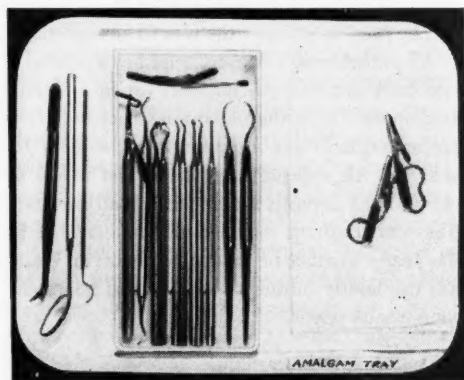
The trays are 10 by 14 inch white enameled trays of the type used by butchers for meat display, available at restaurant supply stores. A 17 by 17 inch paper napkin is folded to fit the tray, and the instruments are placed on it. The tray is covered by a sterile towel and placed in the rack.

New dental assistants can be taught quickly how to make up the work-trays if there are available 8 by 10 inch photographs of each type of tray. In one set of photographs the trays are shown in the order used. In the other set, the name or number of each instrument appears under each item. In this way it is easy for the assistant to learn names and types. The photographs are fastened to the wall above the bench in the preparation room where the work-trays are readied for use. Instructions for photographing the work-trays are given.

Figure 2 Completed work trays stacked in readiness for the next day's work



Figure 1 Typical work tray containing instruments and materials for placing an amalgam filling



Standards of hygiene in the dentist's office

(Allgemeine Hygiene im zahnärztlichen Sprechzimmer)

Ulrich Berger. *Deut.Zahnärztebl.* 9:876-881
Dec. 22, 1955

Dentistry has taken advantage of many recent scientific developments. New dental materials, instruments, machines and technics now are generally used. Patients, relieved of fear and pain, are more cooperative, and such an attitude enables the dentist to do more, easier and better work at each appointment.

Compliance with the most rigid demands of hygiene, however, is imperative in arrangement and organization of the dentist's office.

The reception room should be painted in pleasing and easy-to-clean oil colors which will lessen the patient's nervous tension. All windows should be of transparent glass. If draperies are necessary, plastic materials are preferable to the commonly used textile fabrics. The reception room should be hygienically and psychologically perfect, clean but rather homelike.

Because the dentist's work will be less fatiguing in pleasant surroundings, a careful planning of light fixtures, and the utilization of hygienic schemes in decoration and furnishings are important in the operatory. Glaring lights should be avoided; subdued colors contribute greatly toward minimizing nervous strain for both patient and dentist.

Even though a homelike atmosphere is desirable, wallpaper, carpets and rugs are unhygienic and therefore have no place in the dentist's office. Air conditioning and air filtering is essential for removal of germs.

The dental chair is the main piece of equipment, naturally. All activities are centered in this chair; therefore, it should be the finest and most modern piece obtainable. Even though the dental chair fulfills all hygienic demands, its head and arm support should be covered with exchangeable paper towels. Saliva ejector, warm water and cold air syringes, mouth lamps, spray bottles, heaters, call button (to summon the dental assistant), and all instruments should be in easy reach and kept in a sterilized condition. Small towels, which should be used only once, are far

more hygienic than roller towels. Instruments must be kept sterilized but not in alcoholic solutions. They should be put into rust-inhibiting chemicals at periodic intervals.

A specially constructed rotating chair for the dentist, adjustable to any size and stature, will enable the dentist to operate in perfect comfort—to sit down, stand up or to change position.

The instrument chests should be made of metal and glass, and all handles should be replaced with pedals.

The higher cost of a hygienically organized dentist's office will soon be compensated for by an increase in the number of patients and by better, easier and healthier working conditions.

Establishing cost records

M. Jules King. *J.Florida D.Soc.* 26:7-9
Jan. 1956

The first step toward successful dentistry is for a dentist to figure out for himself what it costs him to practice per hour. Other pertinent factors in establishing fees are the dentist's personal budget, personal security, and his right to a financial status of ultimate comparative wealth.

The various types of dental operations should be catalogued, and the time required for each operation should be recorded. The average number of working hours per year should be estimated. Estimated totals should also be made for office and business expenses, basic family living expenses, personal budget, taxes and debts, and savings.

The day sheet of a dentist, on which the time of each operation is recorded, is the most important cost record. Information from the day sheet can be used to estimate the fees to be charged.

All professional income should be deposited in one bank account. All business expenses should be disbursed from this one business account, with proper explanations to facilitate subsequent tax analysis. All expenditures should be made by check. Bank deposits should include all currency. The total business expense is then divisible by the yearly number of productive hours to establish the hourly business cost, and the hourly income requirement.

Professional (malpractice) liability insurance

Charles F. Suter. *J. Dist. Columbia D. Soc.*
31:5-6, 19 March 1956

Professional liability insurance, originally called "malpractice liability," originated about 40 years ago when a policy was designed to protect a physician from claims arising from malpractice, error or mistake. The basic purpose is to protect the professional man against his liability and the cost of legal defense for suits based on his failure to use the degree of skill expected of one in his profession.

Since 1952 the National Bureau of Casualty Underwriters has exercised jurisdiction over the professional liability field. This has resulted in uniform policy provisions and rates. Today, professional liability insurance is available to about 25 classifications of persons and institutions, including dentists, medical general practitioners, surgeons, hospitals, druggists, accountants, architects, abstracters, chiropractists, lawyers, nurses, dental hygienists, optometrists, opticians, veterinarians and funeral directors.

Most claims against dentists arise out of extractions, cut lips, cut tongues and ill-fitting dentures.

The standard medical general practitioner's, surgeon's and dentist's professional liability policy provides for the insuring company to assume "payments on behalf of the insured of all sums which the insured shall become legally obligated to pay as damages because of injury arising out of malpractice, error or mistake in rendering or failing to render professional services in the practice of the insured's profession, by the insured or by any person for whose acts or omissions the insured is legally responsible except as a member of a partnership."

When two or more doctors are in partnership, to be fully protected they must each have individual policies just as though they were practicing individually, and they also must have partnership coverage, for which the added premium is 33.3 per cent of the individual rate.

A dentist who employs another dentist as a salaried assistant may obtain protection for any actions of the employed dentist by paying an

additional premium of about 33.3 per cent of the basic premium. In such instances, the assistant himself does not have any coverage under his employer's policy; therefore, an employed dentist who conducts any practice on his own should have an individual policy in his own name for full protection.

Malpractice policies are available also to dental hygienists which cover them for acts "personally committed by the insured in the course of his employment by another."

Practice management, and why people don't go to the dentist

Walter T. McFall. *S. Carolina D. J.* 14:66-81
May 1956

The average dentist in the Southeast in 1954 had 1,530 patients in his office for treatment. The average patient remained in the dentist's office for from 56 to 88 minutes.

Eighty-five per cent of the dentists in South Carolina employ assistants, and 74.6 per cent belong to the South Carolina Dental Association.

A patient does not choose a dentist because of the latter's office equipment or technical skill. A patient likes to be taken care of promptly and to have a fixed appointment.

The Dental School of the University of North Carolina has an excellent correspondence course for dental assistants, comprising 25 lessons, each requiring from four to six hours of study.

The dentist should seek to keep his appointments promptly, and to have time for emergencies. Thirty minutes each morning and thirty minutes each afternoon should be set aside for emergency appointments.

Too many dentists neglect to make wills and neglect to carry enough insurance to take care of their families.

The income of the average dentist in the United States totals between ten and eleven thousand dollars net annually. The average dentist with no dental assistant will have a net income of \$7,007 annually; with one dental assistant, a net income of \$11,135; and with three employees, a net income of \$15,115. Overhead expenses for the dentist with no assistant average

about 24 per cent of gross income; with one assistant, 41.9 per cent, and with three employees, 45.7 per cent.

The dentist who earned \$15,000 gross in 1940 to achieve a net income of about \$8,000 would have to produce a gross income today of \$26,386 to achieve a comparable net income, because of the decline in the value of the dollar.

When a new patient comes to the office, the dental assistant should ask these questions: Who referred you? Who is your former dentist? Who will be responsible for this account?

The Buncombe County Dental Society in North Carolina has received from each of its members a list of the five oldest unpaid accounts, so that each dentist in Asheville knows who are the people who are poor credit risks.

A dentist can feel assured that his fees are reasonable if not more than 10 per cent of his patients voice objection to them. If 20 per cent of his patients object, the fees should be re-examined.

Practical pedodontic practice

Edward S. Mack. *J.Den.Children* 23:13-24
First Quart. 1956

For a successful dental practice, the location of the office and the business methods used are as important as the dentist's professional ability, personality and ability to manage patients.

The new dentist, before planning to open a dental office in a given community, should ascertain that the average families are well established and of a type to demand good dental service; that the area could use another dentist; that the area is growing, with good transportation facilities, and that community income is not seasonal.

People like offices that are clean, neat, functional and charming. When the dentist caters to children, the taste of the child must also be considered. Effective means to appeal to the child include a children's corner in the reception room; a decorative theme dealing with cowboys or animals, the circus or nursery rhymes; an aquarium; a chest of inexpensive toys, or a dental health education exhibit.

Office policy can be set forth with a sign on the door of the reception room leading to the inner office: "Parents are requested to remain in the reception room except during consultation."

A consultation room, designed not to look like a dental office, is helpful to the pedodontist.

Establishing good professional relations

Charles F. Bodecker. *New York D.J.* 22:177-178
April 1956

Good professional relations with patients is the key to the success of a dentist. Too little emphasis is placed in the undergraduate years on this phase of dental practice.

Patient confidence rests on a number of apparently insignificant details. Fundamental is the patient's conviction that the dentist is thoroughly capable and sincerely concerned with the work in hand. Although most patients have little or no conception of professional ideals, they are experienced with high-pressure salesmanship and have a well-developed sales resistance.

One method of dealing with the skeptical patient is to list the work which is necessary and that which may be delayed. This impresses the patient with the fact that the dentist is not looking for work.

A major factor in acquiring the patient's confidence is to convince him that the dentist realizes he is operating on sensitive tissues. The dentist must treat the patient as he, himself, would be treated.

Some dentists achieve faultless dental reconstructions, and yet are far from the top of the ladder of success. Other dentists perform only average work, yet are highly successful. When faultless work is linked with good professional relations, the dentist is almost bound to succeed.

The confidence of the patient in his dentist is the prime factor in creating good professional relations. The dentist should take care not to cause unnecessary discomfort. He should warn the patient of impending pain, and tell the patient when no pain is to be expected. Other factors in establishing a feeling of confidence are the use of a light touch, immaculate hands, good operating posture and a clean breath.

Dentistry around the world

Dentistry in India (Zahnheilkunde in Indien)

Walther Müller, Zürich. *Österr.Zschr.Zahnhk.*
10:95-99 April 1956

India, with an area of more than 1,500,000 square miles and a population of about 350,000,000, recently made great progress in reorganizing its educational system to bring it nearer to European and American standards.

The All India Dental Association was successful in obtaining a special Dental Act, which safeguards both dental education and dental practice. This law represents the interests of both qualified and unqualified dentists. To clarify the term "unqualified," it must be understood that many dentists in India have had no formal dental training because of the lack of dental schools and the widespread practice of dental apprenticeship. The All India Dental Association also was successful in inducing the government to award scholarships to deserving students so that they are able to take courses at dental schools in the United States or Europe.

A constant demand for more educated dentists, however, still exists. Every year, only 100 students pass the final examinations at the six dental schools. Of the 800 practicing qualified dentists, more than 700 practice in large cities such as New Delhi, Bombay, Calcutta, Madras, Lucknow and Allahabad. In spite of the Dental Act, more than 3,000 unlicensed practitioners (besides the acknowledged unqualified dentists) treat patients in smaller cities and villages. These unlicensed (mostly native) practitioners specialize in tooth extraction and construction of simple dentures. Conservative procedures are neither known nor used. Hashish or opium, either chewed or smoked, is used as an anesthetic.

Recently, the newly organized school dental service, as yet functioning in the large cities only,

represents the most important development in India's public health service. About 75 per cent of the school children of the large cities receive pedodontic and orthodontic treatment.

Other features of the Dental Act aim toward a better dispersion of dentists in relation to the population and toward care for children under school age, and give adults access to treatment at reasonable fees in clinics affiliated with hospitals and universities. Each clinic treats more than 20,000 patients in a year.

India's government and the people are striving hard to remedy obsolete conditions, and an awakening both of the people and of the authorities already is observable.

To accomplish all these goals, an additional 2,000 qualified dentists are needed to bring the ratio up to one dentist to 100,000 population.

The dental graduate

Editorial. *Pakistan D.Rev.* 6:25, 35 Jan. 1956

Some of the unemployed dentists in Pakistan should be employed in national dental clinics and hospitals, but only to the extent that such dentists are necessary for the upkeep of the health of the nation. It is futile to hope that the government can provide employment to every young dental graduate in Pakistan.

The prospective dental student should ask himself the following questions: (1) Is there a possibility of obtaining a government post? (2) If not, is there scope in private practice? (3) If so, will there be finances to equip a surgery? (4) If not, can I obtain an assistantship?

It is stupid to talk of closing the Dental College. The College should investigate candidates for dentistry and should impress on them the possible difficulties that must be confronted.

There is immediate need for a dental service extending to every part of the country. The original plan to set up 16 district dental clinics has not materialized; the plan should be implemented at the earliest opportunity.

The dental profession must press its claim to recognition as an integral part of medicine. If the original plan of district dental clinics is achieved, and if the health authorities become alive to the

importance of dental service, there will be fewer unemployed dentists. In the meanwhile the young graduate must learn to depend on his own resources. Private practice provides a wide field of service to the community, and fair remuneration.



Forensic dentistry

Dental evidence in forensic medicine

Munir A. Kanaan. *Lebanese D.Mag.* 6:27-31
January 1956

Dental evidence plays a great role in the determination or verification of personal identity in instances where other means preclude positive identification. This is especially true in mass disasters such as airplane accidents, drowning, fires and explosions, and identification of living criminals by the study of bite marks in foodstuffs and in human tissue.

Dental evidence in the identification of missing persons and in the detection of criminals is based on the fact that it is most unlikely to find the dental characteristics of any two persons exactly alike. In addition, the teeth are composed of the hardest and most indestructible tissue in the body, and the material used to restore them also resists destruction. The teeth are situated in the oral cavity surrounded by a hard bony frame which further protects them from extraneous destructive agents.

Among identifying congenital anomalies of the teeth are missing teeth, the relations of the jaws to each other, supernumerary teeth, and anomalies in the size of teeth.

Dental restorations may help to identify unknown corpses or human remains. Identifications by recognition of dental work usually are not reliable unless supported by evidence provided in the actual case record.

Certain dental materials are sufficiently resistant to heat that they may be found intact among the ashes of otherwise completely incinerated bodies. A man loaned money to a physician friend. The physician refused to repay the loan

despite repeated pleas. Finally the physician asked the loaner to come to his clinic to settle accounts. The loaner came and was never seen again. The inquest, undertaken by the metropolitan police of Scotland Yard, indicated that the man was last seen entering the doctor's clinic. A search among the ashes in the furnace revealed a complete artificial denture which was identified by the dentist of the victim to be the loaner's denture. In the presence of this evidence the physician confessed the murder.

In certain instances where post-mortem material cannot be identified by the usual means, the determination of the approximate age of the victim by the study of his teeth may be of help in identification. Information as to age may be derived from a gross, roentgenographic or microscopic examination of the teeth, either *in situ* or isolated. The determination of the age of an individual by such means of study is not very reliable in adults, but a rather accurate estimate can be made of the age of children from a study of the teeth. It is not usually difficult to determine whether a given set of teeth belongs to an adult or to an aged person.

It is much easier to establish that impressions made by the anterior teeth in pieces of food or in human tissue were not produced by the individual in question than to prove the contrary. Bite marks in human tissue must be photographed as soon as possible after discovery. A cast must be made of bite marks in foodstuff.

Dentists should keep careful records of their patients and of the restorations or replacements done for each patient.

Plane crashes and dental records

U.S. Navy M. Newsletter 27:28 March 23, 1956

The recent story of the Marine Corps plane that crashed in California, in which the manifest listed the names of passengers who were actually on another plane, highlights a little known but important function of the dental officers on duty at the Dental Division, and the importance of accurate dental records in identification of the dead.

When the list of the passengers aboard the ill-fated plane reached the Bureau of Medicine and

Surgery, the officer on duty called the Dental Division duty officer and arranged to obtain the dental records from the Physical Qualifications and Medical Records Division. The transfer of the data on the dental records from Washington, D.C., to California was accomplished by telephone; about two minutes per person was required. The three dental officers involved worked through the night in this effort of positive identification, so important to the next of kin and for the settling of estates. When the error in the passenger list was discovered on the following day, the transmission of new dental records had to be accomplished.

Often the teeth are the only means by which identification can be established. It is impossible to overemphasize the importance of accurate markings on the dental record, and the prompt submission of records to the Bureau of Medicine and Surgery.

The case of the telltale tooth

Peter C. Coulding. *Today's Health* 34:30-31, 63 April 1956

To the dentist, the patient's mouth may be a veritable diary of intimate information. The observant dentist may be able to tell if the patient has ever lived in another country, if his general health is bad, what his occupation is, the part of the country he came from, and even his approximate age.

Teeth reveal personal habits and occupations. Seamstresses often develop two tiny opposing notches in their front teeth from biting threads. Upholsterers sometimes have a whole row of dental notches because they habitually take a mouthful of tacks, push them one by one past their teeth and then pick them out with a magnetized hammer tip. Bakers and confectionery workers often exhibit an unusual circular area of decay at the gum line because of their constant association with sugar. Those who work with chrome or steel may have an orange stain on the teeth and ulceration of the mouth tissue. Rose-red spots on the mucous membrane, and eruptions and swelling of the gums, point to excessive exposure to carbon monoxide.

Dentists in different areas of the nation tend to use certain technics or materials. In the East, dentists use more silver amalgam for fillings than do their colleagues elsewhere; in the Northwest, dentists favor the use of gold foil. Plastic space maintainers are favored in the Far West, whereas dentists in the Northwest favor metal space maintainers.

Among dental clues which have led to the arrest of criminals are tooth marks in an apple core and a dental impression left in a spoonful of peanut butter.

▼ History

European museums of interest to American tourists

Frederick Stenn. *J.A.M.A* 160:1090-1091
March 24, 1956

A traveler to Europe will be richly rewarded if he visits the various medical museums attached to the hospitals and medical schools, which house treasures representing stages in the growth of medicine. One of the finest is the Museum of the History of Medicine at the University of Rome; in its collection are an Etruscan skull showing a gold bridge of the lower incisors; a model of a Renaissance theater of anatomy; prosthetic appliances used in the medieval period, and a Roman traction apparatus for the correction of fractures. The costumes of doctors throughout the ages are unique. The surgical instruments used in Pompei about the time of Christ, resembling, to a surprising degree, those used today, may be seen in the Natural Museum of Naples.

The Museum of Public Assistance in Paris has an elaborate collection of bleeding bowls and ancient infant feeding bottles, one of these made of horn.

The Museum of the History of Medicine attached to the Faculty of Medicine of Paris has on display surgical instruments from ancient Japan, Egypt, Herculaneum and Rome.

The Surgeon's Hall in Edinburgh contains a collection from the era of Lister, plus Chinese

surgical instruments and Indian oculist instruments. Here is the first hypodermic syringe, which was used in Britain in 1853. The Anatomy Museum of the University of Edinburgh has on display the skeleton of William Burke, who was hung in 1829 for having murdered 16 persons for the purposes of dissection.

The skeleton of the famous Irish giant, Charles Byrne, may be seen on the first floor of the Museum of the Royal College of Surgeons in London. Among the thousands of specimens collected by John Hunter are some illustrating basic principles of tooth transplantation. Other fascinating medical museums in London are those at Guy's Hospital, St. Bart's Hospital and the London Hospital.



Organization

Fraternalism and Michigan dentistry

A. H. Grob. *J. Michigan D.A.* 38:167-168
April 1956

The oldest professional fraternities in existence were founded at the University of Michigan. The first law fraternity was formed in 1869, the first medical fraternity in 1882. The first dental fraternity, Delta Sigma Delta, was formed in 1882 and the second dental fraternity, Xi Psi Phi, was formed in 1889. Two other dental fraternities, Psi Omega and Alpha Omega, have been active in Michigan for many years.

Delta Sigma Delta has initiated 26,511 members. It has 36 undergraduate chapters and 42 graduate chapters. Its favorite project is the Delta Sigma Delta Educational Foundation which operates to loan money to any deserving dental student. This fund is supported by donations from the fraternity at large.

Xi Psi Phi has a membership of approximately 19,500, and has 30 undergraduate and 39 graduate chapters. It sponsors high scholastic achievements among undergraduates by awarding honor keys to students with the highest scholastic standing. It also sponsors lectures and clinics

which are held in the laboratories of the fraternity houses.

Psi Omega, the largest dental fraternity in the world, was founded in 1892 at the Baltimore College of Dental Surgery. It has over 26,000 living members, 35 undergraduate and 43 graduate chapters, and is international. The primary objective of Psi Omega is to assist undergraduate members by financing chapter houses, student loans, scholarship awards and individual assistance.

Alpha Omega was founded in 1907 at the University of Maryland. It has 8,100 members, 29 undergraduate and 47 graduate chapters. Based on Judaism, professionalism and fraternalism, it sponsors both a student aid fund and a special fund to aid in the rehabilitation of members who serve for long periods in the Armed Forces. It bestows awards for distinguished scholastic achievement.

The four great dental fraternities operate in a sphere which is difficult to measure. They are primarily concerned with the problem of human relations, with ethical principles, cooperation, teamwork, social values, and the inculcation of a mature perspective in the individual toward his work, his fellow practitioner, and toward society.



Industrial health plans

A dental health program in industry

Glenn Bennett. *Health* 13:26-27 Jan. 1956

The Consolidated Water Power and Paper Company operates pulp and paper mills in Appleton, Biron, Stevens Point, Whiting and Wisconsin Rapids, Wis., and has timber holdings in several regions in the United States and Canada. In the past 17 years the company has developed a unique dental health program for its employees through its Employees Benefit Association, a voluntary, nonprofit organization.

In 1937, George W. Mead, then the president of the company, recommended that dental benefits be added to other employees' benefits, with no increase in premium. The dental benefit began

with a maximum annual allowance of \$10; in June 1947 the benefit was increased to \$15. Only 50 per cent of the association members exercise their right to dental treatment.

The total sum paid to dentists during the first full year of the program was \$4,089.63. There has been a gradual annual increase to \$12,341.25 in 1954. A grand total of \$130,267.90 has been paid to dentists since the program was instituted.

Members have a free choice of dentists, and different fee schedules prevail in different dental offices.



Interprofessional relations

What the dental profession has to offer in the development of more adequate chronic disease programs

Donald J. Galagan. *Am.J.Pub.Health* 46:450-456 April 1956

The dental profession has failed to put forward new ideas for the care of the chronically ill, and the medical profession has been conducting chronic disease programs without giving enough thought to the dental needs of patients.

The dental profession has, or should have, a role in three general areas of the chronic disease problem: (1) the prevention and treatment of chronic dental diseases, such as dental caries and periodontal disease; (2) the early detection and referral of previously undiagnosed nondental chronic illness, and (3) the care and rehabilitation of the oral structures of patients with long-term, nondental chronic illness.

The dentist has the potential ability and the opportunity to detect early several of the general chronic illnesses which are not specifically dental, such as Addison's disease, diabetes, the blood dyscrasias, tuberculosis, mental disturbances, cancer and nutritional disturbances. The dentist should be trained to observe oral lesions and general changes in appearance, in behavior or in physical performance which might suggest the

need for further examination by a competent diagnostician.

The dentist can and should play a vital role in the treatment of many chronic illnesses. Patients should be relieved of all psychologic and pathologic burdens so that their full strength may be concentrated on recovering from their disability.

Today programs are developed for the care of the chronically ill based on the assumption that all supportive health services can and will be provided in the usual manner, when in fact this is not always true.

It is estimated that there are more than five million people with long-term chronic illnesses in hospitals, nursing homes or in their own homes. Most of these people have no way of getting the kind of dental services they need. The health services are fragmented. The general practice of dentistry is built on the concept that the patient can always come to the dentist. The method of paying for dental services in chronic disease programs is perplexing. Many dentists are hesitant to care for patients with some chronic diseases, even when the physician has determined that such treatment is safe for both dentist and patient.

The following steps should be taken to develop the dental components in chronic disease programs:

1. The dental problems of the long-term chronically ill patient should be defined more precisely.
2. An analysis should be made of how resources currently are being used.
3. Almost all present-day dental equipment is designed to provide service for the ambulatory patient who comes to the dental office, sits upright in the chair, and cooperates voluntarily with the dentist. Dentists should study and experiment with new ideas in the field of dental instruments, dental equipment and operative technics.
4. Methods must be found to provide dental service to the chronically ill in the home and in institutions without fixed dental facilities. Parts of the dental school curriculum may have to be reoriented to include training and learning experience where the focus of attention is not solely on the ambulatory patient with a specific dental complaint.

5. The basic training of the dentist must be extended to raise his index of suspicion about chronic disease, to facilitate early detection.

6. Methods must be found to finance the dental service needed by those with chronic illness.

7. The medical and dental professions must plan together for integration of health services for the chronically ill.

Dentistry for the ship surgeon

E. Joseph. *Brit.M.J.* No. 4968:679-681
March 24, 1956

The ship surgeon may quite often be called on to deal with dental conditions. A few sessions in a dental outpatient clinic will be of greater value to the ship surgeon than all the articles which can be written.

The relief of dental pain can be effected with a few inexpensive instruments and drugs, including the following: a dental mirror and probe, a pair of tweezers, excavators and filling instruments, a hypodermic syringe (preferably cartridge-type), and extracting forceps. The drugs should include zinc oxide powder, oil of cloves, a local anesthetic solution such as 2 per cent procaine, 1:1,000 epinephrine hydrochloride solution, absorbable hemostatic gauze and codeine tablets. Armed with these the surgeon is able to deal with the usual dental conditions that arise during a voyage, such as toothache, swollen faces, persistent hemorrhage after an extraction, erupting third molars and ulceromembranous stomatitis. A simple treatment for each condition is discussed.

Pain from caries can often be relieved by excavating the carious dentin and filling the cavity with a mixture of zinc oxide and oil of cloves.

For an alveolar abscess an adequate course of some suitable antibiotic should be started immediately—for example, 500,000 units of sodium

penicillin twice a day until the condition is controlled. Once the inflammatory process has resolved and the swelling has subsided, the tooth can safely be extracted under local analgesia.

Technics for extracting individual teeth are discussed. Pressure is the cheapest and best method of arresting postoperative hemorrhage. A rolled-up swab is placed directly over the socket, and the patient is instructed to bite firmly on it for 15 minutes.

Fractures of the jaw result in pain on movement, trismus caused by muscle spasm, and malalignment of the teeth. If the mucosa is torn, or if a hematoma can be seen in the mouth, antibiotic therapy should be instituted to prevent the fracture line from becoming infected. The patient is encouraged to keep his mouth clean by using a soft toothbrush wherever possible, and he should use alternate mouthwashes of sodium bicarbonate and hydrogen peroxide at frequent intervals.

To achieve immobilization of a fractured jaw in the absence of specialized knowledge and equipment, resort must be had to simple measures. A head bandage of webbing or calico which goes under the chin and is attached to a circular band around the forehead and occiput is preferable to either the classical "four-tailed" bandage, which is likely to displace a fragment posteriorly, or to the barrel bandage, which quickly stretches and loosens. A wide strip of adhesive plaster can be placed from chin to vertex. Edentulous patients should be immobilized with their dentures in position so that these act as a splint. Some anterior teeth can be filed off a denture to allow a space for feeding. Simple fractures should be immobilized for from four to six weeks.

A patient will need about 3,000 calories a day. A patient with missing teeth can feed himself through the spaces with a spoon or a rubber tube from a feeding cup. In the absence of such spaces, there is room enough behind the last molar tooth for feeding purposes.

Operative dentistry



Rehabilitation or equilibration

The diagnosis and correction of functional malocclusion

Blair C. Madsen. *New York J.Den.* 26:5-13
Jan. 1956

The conditions of many patients with evidence of periodontal disorder, abrasion or discomfort in the anterior segments of the mouth are incorrectly diagnosed and treated as reduced vertical dimension. A functional analysis of the patient's occlusion may reveal that the normal arc of closure is altered by premature contacts, causing a protrusive thrust of the mandible and forcing the occlusion to function eccentrically. When this malfunction is corrected by occlusal equilibration and by provision of posterior balancing support in protrusive excursion, all traumatic factors can be eliminated. In many instances there is no need to increase the vertical dimension by means of occlusal reconstruction, bite plates or splints.

Roentgenographic and clinical evidence of continued improvement, and of the restoration of the structures supporting the incisor teeth to a state of health, can be demonstrated. The technic can be applied with a minimum of surgical intervention, expense and time.

Practical technics of diagnosing and correcting pathologic occlusion have been described by McLean, Schuyler, Westbrook and Madsen.

The patient is asked to close to a rest position with the teeth slightly apart, and is warned to keep the teeth from touching until a signal is given. The operator places his fingers in position

on the upper and lower teeth (Fig. 1). The mandible is then guided into retrusion while the teeth still remain slightly apart. The patient is then asked to close lightly 1 mm. at a time without exertion until the first teeth meet. When asked, the patient readily points to the area of first contact. The area can be verified by interposing a thin carbon paper between the upper and lower teeth, and again asking the patient to close until the first contact is felt.

Before attempting to make corrections by occlusal equilibration, the patient's occlusion should be analyzed by means of study casts mounted in an anatomic articulator.

Premature contacts which interfere with the normal hinge axis closure of the mandible always

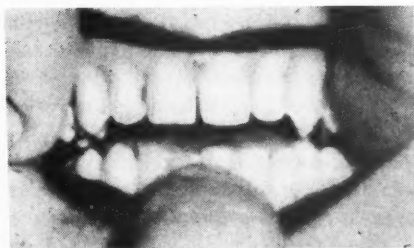


Figure 1 Diagnosing functional malocclusion through controlled closure

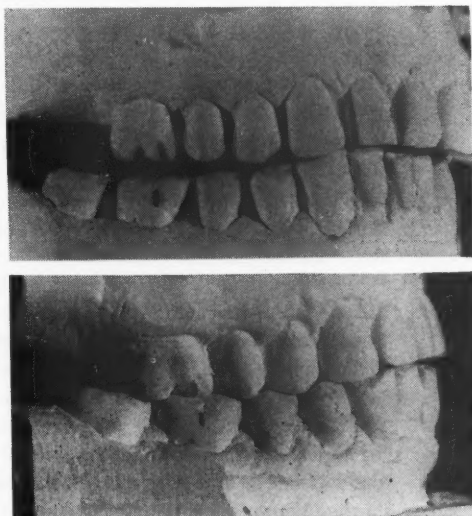


Figure 2 Right lateral excursion before and after correction

occur (and show carbon marks) on a distal inclined plane of the lower tooth involved and a mesial inclined plane of the upper tooth involved. These interferences are corrected by reducing them with a stone.

The reduction is made first on the distal incline of the lower tooth, grinding from the height of the carbon mark (near the tip of the cusp) toward the base of the cusp. Reduction is then made on the mesial incline of the upper tooth, grinding in the same way. The objective is to make these interfering distal and mesial inclined planes, which strike first in hinge axis closure, approach horizontal planes. When this is accomplished, the inclined planes of these cusps no longer will interfere with the arc of normal hinge axis closure of the mandible. This precise and discriminate reduction of interferences will not "close the bite" because no grinding is done at the tip of the cusp. Only the interfering inclines of the cusps are ground.

For the relief of trauma during protrusive excursion in patients with a deep vertical overlap in which the curve of Spee is relatively normal, posterior balancing support is provided.

The dentist's role in some temporomandibular joint disturbances

Howard J. Merkeley. *J. Pros. Den.* 6:347-349
May 1956

J. B. Costen in 1934 focused attention on the temporomandibular joint as a frequent contributor to many and varying disorders.

During the past year, every patient complaining of temporomandibular joint pain was found to be suffering from nervous tension.

The treatment should be threefold: the physician or the psychiatrist should determine the cause of the nervous tension; the dentist should discourage the patient from clenching his teeth, and the patient should treat the occipital region.

The temporomandibular joint can be relieved by appliances which increase the occlusal vertical dimension. The appliance should be placed distal to the fulcrum point so that the condyle will be lowered as the incisors are raised.

Teeth clenching can be discouraged by placing

a silicone appliance about 3 mm. thick over the first molars. The appliance is cupped on both sides so that on occluding the teeth are locked in one position in occlusion, thus preventing any grinding. The silicone appliance is resilient enough to give on firm occlusion. It continues to give as the teeth are clenched more tightly, to defeat the satisfaction of clenching. The appliance should be worn night and day except at mealtime, over a period of a few months. The patient should be taught how to massage his neck firmly from the mastoid eminence on one side to that on the other side; massaging should be done for three minutes, at least three times daily.

Orthodontic intervention in the wearing down of teeth

M. S. Tussenbaum. *Stomat., Moscow* 6:51-55
Nov.-Dec. 1955

Friction subjects the opposing dental surfaces to systematic wear—rapid and with considerable tissue damage in some persons, and slow, although considerable, damage in others. In still other persons, the wear is insignificant.

Considerable wear lowers the bite and subjects the soft tissues of the mouth to damage by the sharp edges of the teeth; denuded dentin reacts to temperature fluctuations and to chemical influences, causing pain; chewing capacity diminishes, and the facial contours change. With orthognathic bite and anterior overbite, the wear is vertical and sharp edges are formed. Sometimes the chewing surfaces of lateral teeth as well as the labial and lingual surfaces of anterior teeth wear out. With direct bite, the wear is at the cutting edges of the anterior teeth and the chewing surfaces of the posterior teeth, or horizontal.

Dental wear depends not only on mechanical factors involved in chewing but on the neurodystrophic phenomena that determine the biologic quality of the tissues. Tissues of full biologic value, whatever the type of bite, wear out less noticeably. When the tissues are not of full biologic value or when the teeth are subjected to constant chemical action (for example, among persons working in chemical factories), the wear is rapid; the pulp perishes; tissues near the sur-

face undergo pathologic changes and granulomas and fistulas appear. Different combinations of mechanical factors and the biologic value of the tissues determine the physiologic and pathologic forms of the wearing process.

However wear is classified, two types exist—the physiologic and the pathologic. The type of wear, according to this investigator, depends neither on age (Entin) nor on the appearance of the worn tissues (Grozovsky) but on changes in the chewing apparatus resulting from wear (soft tissue trauma, pain, close bite, diminution of function and so forth). Classification must be based on signs aiding in the correct choice of treatment method.

If pain is insignificant, coagulative medications are used. If pain is severe, the dental pulp is removed and the tooth is filled. If wear is significant and rapid, the object of treatment is to slow down the wearing process and to remove destroyed portions of the chewing apparatus; medication is combined with orthodontic treatment.

With an orthognathic bite and insignificant wear of tissues, the bite is not raised, but occlusal surfaces of pairs of antagonistic teeth are reinforced with metallic caps or crowns in the anterior and lateral parts of the jaw in a triangular arrangement. When the bite is low, connected or unconnected caps are used to cover all the worn teeth to raise the bite to normal height. If the bite is orthognathic and the wear insignificant, opposing metal caps are used only at the sides of the jaw; if the wear is considerable, crowns, caps or bridgelike prostheses (to restore continuity of the denture) are used at the sides. The principle involved in the use of opposing metal caps or crowns is that the metal wears more slowly than the dental tissues, thereby considerably delaying the wear of the tissues themselves.

Two cases are reported, one involving a patient 49 years old, the other a patient of 67. The difference in age notwithstanding, the type of wear in each case was nearly identical. Both patients had orthognathic bite. In the first, the wear was complicated by chronic periodontitis; in the second, no complications were observed. These cases tend to support the theory that wear depends in the main not on mechanical factors (wear of antagonistic surfaces) but on biologic factors, namely, the quality of the dental tissues and the

general state of the organism. To attain the desired effect, medical, surgical and orthodontic approaches were combined in treating the first patient. Only orthodontic measures were used on the second. In both cases, after appropriate preparation, opposing metallic prostheses were used.

Occlusal pivots

Victor H. Sears. *J.Prost.Dent.* 6:332-338 May 1956

The occlusal pivot is a factor in successful denture service and an important means of giving the patient relief from distressing conditions associated with the temporomandibular joint.

Mechanical stress in the temporomandibular joint may be horizontal or vertical. Horizontal stress on the condyles may result from the action of cusp inclines. With artificial dentures, such stress results from tooth occlusion out of harmony with jaw relation. Vertical stress at the condyles may result from allowing the occlusal load to be too far to the front of the mouth. When the occlusal load is carried as far forward as the first bicuspid, the mandible becomes a lever of the third class. Occlusal loading too far forward in the mouth produces a breaking down of the anterior parts of the dental ridges, a bending of the mandible at its weakest place (usually just anterior to the angle), and an upward displacement of the condyles in their sockets. The first two conditions can be modified by maintaining the load in the molar regions. The upward displacement of the condyles can be reversed through use of the occlusal pivot.

Pivots should be from 1 to 3 mm. high when first inserted, depending on the anticipated amount of descent of the condyles. When one condyle has a greater upward displacement than the other, the pivot on the side of greater displacement should be the higher.

Occlusal pivots act to reduce the unfavorable stresses, especially the upward stresses, in the temporomandibular joints. With sufficient reduction of these stresses, the condyles can return toward their normal positions. Pivoting is a means of stress reduction and is not a forcing of the condyles into new positions, nor a balancing of the teeth, nor clearing the occlusion, nor bite

raising. It moves the occlusal load to the back of the mouth to reduce the upward force at the condyles. The prime function of the pivot teeth is to permit the condyles to descend toward their unstrained vertical position and to assume their unstrained horizontal position.

A simple way to apply the pivoting principle is to build the elevations on the molar teeth, thus holding the opposing bicuspids and anterior teeth apart. These elevations can be made with self-curing plastic material. If it is desired to use pivots without increasing the degree of jaw separation, the molars should be left at the established height and all the teeth anterior to the molars should be ground down to be out of contact in centric jaw relation.

The pivot tooth should be cusplless to avoid any horizontal stress at the temporomandibular joint. Usually the first molar is the farthest posterior position for the pivot. The patient should be recalled periodically for occlusal adjustments. Occlusal pivots provide welcome relief to dental patients.



Inlays and fillings

Silver amalgam

Robert F. Eastman. *S. Carolina D.J.* 14:37-44
May 1956

Amalgam is the most valuable filling material in use today. With good cavity preparation and good technic, even a poor material may give better results than the best amalgam placed in an indifferently prepared cavity with poor technic.

Fine cut alloys gain strength much faster and have better working qualities, such as ease of manipulation, ease of amalgamation and good carving qualities.

Amalgam fillings may fail for the following reasons: fissures incompletely cut out; recurrent decay at the gingival edge of proximal buccal and lingual margins; improper contour, improper contact and overhang; decay left in cavity prepara-

tions, or fracture of the filling on the occlusal surface along acutely flared buccal or lingual margins.

In complex cavity preparations, if the proximal anatomy is favorable and the lesion is small, the occlusal third of the proximal outline can be kept more narrow than the gingival third, in which case the neck of the preparation can be kept narrow. If the occlusal third of the proximal outline must be made wide, the neck must be made wide to minimize the acuteness of the buccal and lingual flares.

Amalgam cavity preparations should be cut as deep as possible without endangering the pulp; the more bulky the amalgam, the stronger it will be. The pulpal wall should be in dentin, flat, and the surrounding walls parallel to each other or undercut slightly. The gingival wall should be flat and cut at right angles to the forces of mastication, and the axial wall cut deep enough into the tooth and independent proximal retention gained by boxing so that the angle formed by the junction of the axial wall and the buccal and lingual dentin walls will be a right angle or less than a right angle.

A general rule for depth of cut is 1 mm. in bicuspids and 1.25 mm. in molars, although the size and age of the tooth and the size of the carious lesion influence the depth.

Cavity preparations can be made easier and faster if good diamond instruments and carbide burs are used.

The ratio of alloy to mercury is not too critical, provided enough mercury is used and provided the excess is removed during the packing operation. If too much mercury is used originally, the crushing strength of the finished amalgam will be decreased regardless of how much mercury may be expressed in a squeeze cloth or in packing.

A standardized technic for triturating should be used. A hand-operated mortar and pestle may be the best choice for trituration, unless the ratio of alloy to mercury and the trituration time are accurately established and a mechanical amalgamator used. A small mortar and pestle should be used for small mixes, a large mortar with a raised center for large mixes. The mortar and pestle should be cleaned and roughened frequently with FFF carborundum powder mixed with water. In mortar and pestle trituration, a definite length of

time should not be adhered to because there are too many variables which influence trituration time—size of the alloy particles, ratio of alloy to mercury, size of the mix, roughness of the mortar and pestle, and the speed and pressure used.

When the mix is bright, smooth, shiny and every particle of alloy coated with mercury, trituration should stop. An under-trituated amalgam results in a finished restoration which has lower crushing strength, expands excessively, and tarnishes and corrodes more readily. Over-trituration produces a stronger, more homogeneous amalgam, but it can also cause shrinkage.

If the proper ratio of alloy to mercury has been used and the trituration process has been completed properly, the amalgam should increase its diameter about a third when dropped on a table top from a height of six inches. The identity of the finger prints should also be retained in the surface.

The purpose of condensation is to adapt the amalgam to the cavity walls and remove the excess mercury which, if retained, causes excessive setting expansion and decreased crushing strength. To accomplish the objectives in condensation, there must be four stable walls and a clean, dry cavity. Properly shaped and sized pluggers should be used as well as comparatively small pieces of amalgam, and heavy packing pressure exerted along the correct lines of force. The packing operation should be completed as quickly as possible.

No matter how carefully the amalgam is carved, margins must be ground flush in places. The preparation for pumicing is accomplished with sandpaper disks, rubber wheels and burs held partly on the tooth and partly on the amalgam.

Dental amalgam poisoning (Intoxicación por amalgama odontológica)

Raúl Acuña Ortiz. *Rev.dent.Chile* 45:799-803
Nov.-Dec. 1955

Since the mercury content of amalgams used for fillings is usually about 50 per cent, it is important

to consider whether mercury losses from fillings can constitute a danger to health. Loss of mercury occurs when mercury vapors rise from the amalgam surface, when mercury contained in a filling is released or dissolved, and when particles are broken or worn off the fillings. Analyses have shown that the mercury content in freshly inserted fillings does not differ appreciably from that of 10 year old fillings; consequently, no danger is to be apprehended as a result of release or dissolution. Some loss undoubtedly is caused by the wear of chewing, but it has been shown not to exceed 0.06 cg. in a year.

Even if mercury were soluble in the body fluids, it would be harmless; as it is, however, mercury combined with tin, copper and zinc is not soluble in these fluids, because the metals named are electropositive to mercury and delay its solution as long as they are present in the amalgam. As for mercury vapors, various amalgams were tested to see if such vapors could be detected, and the only combination in which they were found was one containing copper. The quantity of mercury that could conceivably enter the lungs from this source, however, is negligible and need not be considered. Furthermore, mercury vapors can rise only from surfaces that are dry and polished, which is rarely the case in the mouth, with its constant flow of saliva. Some disintegration of copper amalgam, however, has been demonstrated in oral cavities with an acid reaction and in order to avoid any possible toxic effects from the resulting release of mercury, the excessive use of copper amalgam in fillings should be avoided.

By contrast, there is no danger of mercury absorption when modern silver amalgam is scientifically compounded and correctly used, because the quantity of mercury released from such compounds is practically insignificant.

Finally, it may be pointed out that dental amalgam occasionally is considered responsible for allergic conditions. Careful study is needed in all such instances, however, to make sure that the difficulty is not due to mechanical causes, such as rough surfaces, or to psychological phobias springing from the unfounded fear that the amalgam may be poisonous.

Orthodontics and pedodontics



Orthodontics

Guiding treatment of Angle Class II malocclusion

A. H. Craven, Holland, Mich. *New Zealand D.J.*
52:25-35 Jan. 1956

European orthodontists have pioneered two major developments in the early treatment of Angle Class II malocclusions. The first method, that of the Monobloc, was devised by Robin and subsequently developed by Andresen. The second method, the use of extraoral appliances, was re-introduced by Oppenheim and further developed in North America by Kloehn. The early treatment of Angle Class II malocclusion by the use of the Andresen appliance in the complete deciduous dentition and the use of extraoral appliances during the mixed dentition period may be complementary.

With the Andresen appliance, results are achieved more readily in patients between four and seven years of age. The optimum time for the use of extraoral cervical traction appliances (cervical appliances) extends from 7 to 11 years of age. The eruption of the second permanent molars in the maxilla offers resistance to distal movement of the first molars. The prolonged use of cervical appliances may force the second molar buccally.

The mode of action of cervical appliances has not been examined fully. A preliminary study by Graber (1954) suggests that the pull of the elastics from the back of the neck, when applied

to the maxillary first permanent molars, results in movement of these molars distally within the arch, movement of the entire dental arch distally, or relative delay in the forward growth of the maxilla. Cervical appliances have their main effect on the maxilla, although secondary changes have been observed in the mandibular dental arch.

Construction, insertion and clinical application of the cervical appliance are explained, and two cases are reported.

The first patient, a nine year old girl, had a retrognathic convex facial profile, a short upper lip, and an everted lower lip with a characteristic supramental fold. The upper lip did not cover the incisal edges of the maxillary incisor teeth during swallowing. Study casts were obtained and lateral head roentgenograms taken. The casts revealed an Angle Class II division 1 malocclusion of the mixed dentition with spacing of the incisor teeth in the maxilla and pronounced overjet and overbite. The tracing from the lateral head roentgenogram showed that the skeletal structure supporting the dentition could be responsible for the malocclusion.

It was decided to place a cervical appliance as guiding therapy, hoping to reduce the amount of treatment in the permanent dentition. The objectives were the production of a normal relationship of the first permanent molar teeth and a reduction of the amount of overjet and overbite. The stops on the arch wire of the cervical appliance were placed in advance of the buccal tubes, so that the elastic force was applied to the incisor teeth. An acrylic bite plane was worn during the day.

Fifteen months later, casts were obtained, which showed a normal relationship of the molar teeth, the eruption of the maxillary permanent cuspids, and a reduction of the spacing of the incisor teeth in the maxilla. Overbite and overjet were reduced.

The lateral head roentgenograms were traced and superimposed on the original tracings. Comparison showed that the maxillary molar teeth had been moved distally and that the maxillary incisor teeth were tipped lingually. On the other hand, the mandible had grown forward and downward. A noticeable change had been produced in the relationship of the lower lip to the



Figure 1 Patient

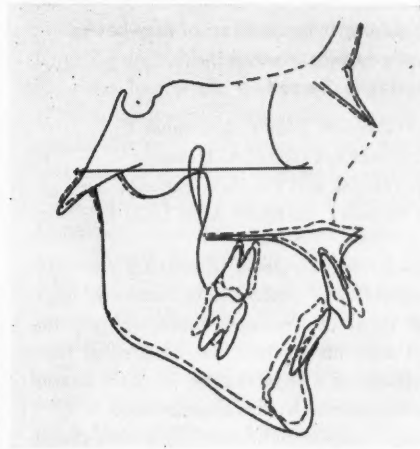


Figure 2 Tracings of lateral head roentgenograms before (dotted line) and after (solid line) guiding therapy

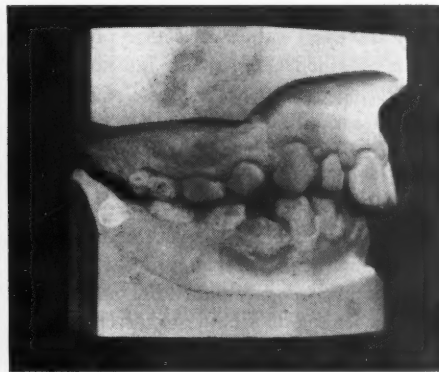
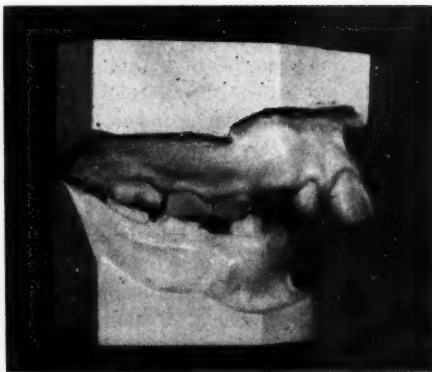


Figure 3 Casts before and after guiding therapy

maxillary incisor teeth. Although it is unlikely that the patient can be treated completely by the use of cervical appliances, the establishment of normal molar relationship and the reduction of incisal overjet in such a poor facial skeleton have simplified later treatment.

The second case illustrates the successful use of a cervical appliance to increase the distance between the maxillary incisors and molars, the patient being an eight year old girl with an Angle Class II division 1 malocclusion of the mixed dentition.

**A cephalometric evaluation of fifty-seven consecutive cases treated by
Dr. Charles H. Tweed**

Morris M. Stoner, John T. Lindquist,
Jack M. Vorhies, Rolenzo A. Hanes,
Frank M. Hapak and Edgar T. Haynes.
Angle Orthodont. 26:68-98 April 1956

There is little information concerning the varying possibilities of orthodontic treatment when different types of treatment mechanics are followed. Useful information can be derived from an assessment of a large number of cases treated in a similar manner by the same person.

A leading proponent of controlling orthodontic treatment to change the soft tissue profile is Charles H. Tweed, who uses the Frankfort-mandibular incisor angle (FMIA) as a guide to improve the soft tissue profile. The authors sought to survey the exact nature of change produced by Tweed's method of treatment and how that change affected the soft tissue profile. Complete cephalometric records of 57 consecutively treated cases were studied. The treatment time varied from 5 to 29 months, averaging 15 months.

The following conclusions are reached:

1. Dr. Tweed's treatment is very effective. It moves teeth, and it moves them far.
2. The tracings demonstrate bodily movement of the upper incisors in a posterior direction.
3. A decided depression of the lower incisors is obtained.
4. Tracings depict considerable reduction in the differences of the anterior limits of the upper lip, lower lip and chin in many instances.
5. The incisors at the anterior limit of the upper lip demonstrate as much change in the nonextraction cases as were found in instances in which bicuspid teeth were removed.
6. The anterior portion of the maxillary base appears to have been moved posteriorly to a greater degree than the so-called forward growth at the chin point.
7. The posttreatment change in the mandible is unpredictable. It can go backward as much as it comes forward. In many instances where the mandible did not come forward, a great posterior recontouring at the anterior limit of the upper lip was demonstrated.

8. The Frankfort-mandibular incisor angle, when moved to the higher readings, permitted other structures to be moved into a position which influenced favorably the soft tissue profile. This improvement was caused mainly by the posterior bodily movement of the upper incisor and premaxillary region, the reduction of the overbite, and in some instances the forward positioning of the chin.

**Prevention of malocclusion by the
general practitioner**

Earl E. Shepard. *J.A.D.A.* 52:560-566 May 1956

Preventive orthodontics should be practiced not only by orthodontists and pedodontists but by general practitioners. Modern dental education provides adequate instruction, and modern dental materials and technics provide new, simple means, for the practice of preventive orthodontics.

The prevention of malocclusion should be stressed among children of low income groups, to prevent the long-term, more expensive corrective treatment required by severe malocclusion.

The interception and correction of bad oral habits is important in the prevention of malocclusion.

The insertion of palatal crib appliances is effective in the treatment of thumbsucking and tongue-thrusting habits. Anterior cross-bites may be corrected satisfactorily by the use of mandibular, anterior, self-curing acrylic splints. Activated space maintainers are satisfactory for correcting tooth positions in the bicuspid regions. The soldered lingual arch wire is of value in maintaining space in instances of bilateral premature tooth loss.

The migration of anterior teeth, caused by tooth loss, may be corrected by means of a lingual arch wire supplied with loop auxiliary springs. Modified Hawley-type dentures may be employed to maintain space, both horizontally and vertically, where premature loss of all posterior teeth has occurred. Hawley dentures incorporating bite planes must be employed carefully to avoid creating open bites and dual bites.

All removable space maintainers and treatment appliances must be kept under close observation

and carefully maintained to prevent tooth decalcification and gingival irritation.

Myofunctional therapy should be used more widely in preventive orthodontics.

Simple techniques for constructing the various appliances used in preventive orthodontics are described and illustrated.



Pedodontics

Treatment of dental emergencies during childhood

Louis B. Kelsten. *J. New Jersey D.Soc.* 27:48-49 April 1956

Unfortunately, a large percentage of children are brought to the dentist only when they are in pain. Because the initial contact determines future success in handling a child, emergency treatment should be rendered quickly and painlessly. Roentgenograms should be taken immediately. Pain or discomfort may be caused by an acute pulpitis or an acute periapical infection.

The diagnosis of an acute simple pulpitis is readily made by the short period in which there is distress, or by pain caused by extremes in temperature, sweets or pressure. The diagnosis of acute degenerative pulpitis is usually made by prolonged pain after extremes in temperature or pressure, or even pain that is spontaneous and which occurs particularly at night.

Treatment consists of removal of most of the leathery dentin, preferably with a large excavator, wiping the cavity with 95 per cent phenol, and the use of zinc oxide and eugenol paste filling. If the pulp is exposed, most of the leathery dentin should be removed without disturbing the pulpal tissue, and the cavity wiped with 95 per cent phenol. Then a pellet saturated with a solution of chlorobutanol in oil of cloves is placed in the cavity which is sealed with a thick paste of zinc oxide and eugenol.

An electric pulp tester or a pellet of cotton saturated with ethyl chloride can be used to determine the vitality of a fractured incisor. A sharp

pain which disappears rapidly on removal of the pellet indicates that the pulp is normal. Prolonged pain indicates that the pulp is in a state of active hyperemia and possibly degeneration. If the tooth does not respond to a vitality test for several days after the accident, the pulp may be in a state of shock but may react normally later.

As little operating as possible should be used to protect temporarily a coronal fracture with or without pulp involvement. The tooth is isolated with cotton rolls, wiped with 95 per cent phenol, and a celluloid crown form or a stainless steel band applied with medicated cement.

The child with an acute dentoalveolar abscess usually presents a history of trauma or of sensitivity to extremes in temperature and sweets. If a permanent tooth is suspected, the dentist must distinguish between root end pathologic condition and an immature root end; if a deciduous tooth is suspected, between root end pathologic condition and rapid resorption.

Treatment usually consists in opening the pulp chamber with a sharp pointed instrument or a small round bur. If a pulpotomy has been performed, all of the material is removed from the tooth for drainage or relief of pressure. Usually the opening of a periapically infected tooth brings immediate relief. If pain, elevated temperature and illness continues for several hours after such treatment, antibiotics should be administered and the tooth removed.

Fractured anteriors

Dean Robertson. *J. Oklahoma D.A.* 44:18-19 Jan. 1956

A classification for fractured anterior teeth is given as follows:

Class I: Simple fracture of crown, involving little or no dentin.

Class II: Extensive fracture of crown involving dentin but not the dental pulp.

Class III: Extensive fracture of crown, involving considerable dentin and exposing the dental pulp.

Class IV: Traumatized tooth has become non-vital, with or without loss of crown structure.

Class V: Tooth lost as result of trauma.

Class VI: Fracture of root, with or without loss of crown structure.

Class VII: Displacement of tooth, with or without fracture of crown or root.

Class VIII: Fracture of the crown en masse and its replacement.

Class IX: Traumatic injuries to deciduous teeth.

The following treatment is recommended for a fractured permanent anterior tooth:

1. The extent of the injury, the type of abnormality, extent of the fracture and of the tissue laceration and swelling is determined.

2. Roentgenograms are taken to determine the size of the pulp, the stage of development of the root end, whether the root is fractured, and to provide a record of comparison.

If the fracture is a simple Class I fracture, the tooth is smoothed, coated with varnish and rechecked in six to eight weeks with a vitality test and a roentgenogram.

If the fracture is a Class II fracture, the tooth is dried and isolated with cotton rolls. Thymol is applied to the exposed dentin, covered with a layer of calcium hydroxide which in turn is covered with zinc oxide. A stainless steel crown is fashioned and placed with zinc oxide. The patient is dismissed for two months.

If there is a Class III fracture, the tooth is anesthetized and isolated with a rubber dam. A no. 4 or no. 6 bur is used to achieve an opening into the exposed pulp horn. The pulp is sterilized and covered with layers of calcium hydroxide, zinc oxide and eugenol, and cement. A treatment crown is placed and the patient dismissed for six to eight weeks.

If the fracture is a Class VII fracture, the tooth is pushed gently into position. An alginate impression of the anterior segment is taken. A self-curing splint is fabricated. The fractured tooth is coated with calcium hydroxide, zinc oxide and eugenol, and cement. The splint is left on for from four to six weeks, and the tooth is examined every two weeks. At the end of six weeks the splint is

removed, and the tooth is checked for mobility and vitality. When the prognosis has been completed in each instance, permanent restorative measures are planned.

Marginal periodontal disease in the deciduous dentition (Die marginale Parodontopathien im Gebiss des Kindes)

Ewald Harndt, Berlin. *A.R.P.A. Internat.* 13:1-15, 1955

All types of diseases of the periodontal tissues can appear in the deciduous dentition. Previously, it was assumed that periodontal diseases occurred in the permanent dentition only. Periodontitis, periodontosis, and mixed types of these conditions, can be encountered in children during the period of the deciduous and the changing dentition.

Periodontal disease in children is not caused by a premature process of evolution appearing before the development of the jaws is completed. Periodontitis and periodontosis are diseases independent of the age of the patients.

In instances of a deep periodontitis involving deciduous teeth only, and culminating in a premature loss of teeth, this process intervenes in the normal development and eruption of the permanent teeth and causes these teeth to be eliminated gradually in the order in which they erupt.

The course of periodontal disease in children is even more rapid than in adults, and the symptoms are more severe the younger the afflicted patient.

Apical periodontitis in children frequently is accompanied by epithelial alterations and bluish discoloration of the soles of the feet and the palms of the hands. This simultaneous involvement of periodontium and limbs, and the parallel appearance of periodontitis and erythredema polyneuropathy should encourage further research into the problem of a possible relation between the diseases and common causative factors.

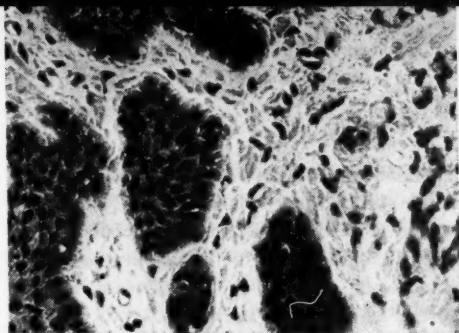


Figure 1 Polymorphism and hyperchromatism in interpapillary epithelial tissues

Periodontics and endodontics



Periodontics

Experimental research on the effects of mechanical gingival massage

(Recherches expérimentales sur les effets du massage gingival par des moyens instrumentaux)

Adriano Bertolini, Reggio Emilia, Italy.
Paradontol., Zürich 9:144-149 Dec. 1955

The importance of a mechanical gingival massage for the prevention and treatment of periodontal disease has been emphasized recently in several reports. The authors are as unanimous in recom-

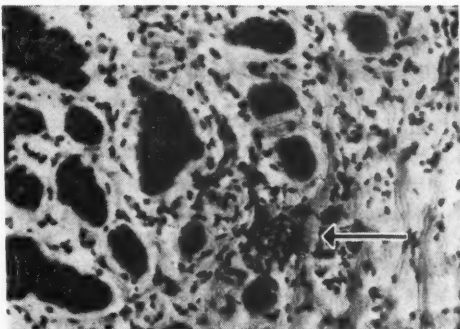


Figure 3 Regrouping of histogenetic elements in a papilla

mending this procedure as they are divided on the question of which technic to utilize.

Previously, it had been assumed that gingival massage was the possible cause of transient bacteremia, subacute bacterial endocarditis and other periodontal diseases. In this assumption, the cardinal point was missed entirely. Masticatory function itself is a kind of constant gingival massage, and neither this function nor any other mechanical friction can cause periodontal disease.

The staff of the Dental Institute of the University of Pisa, Italy, investigated the action and effect of medicated gingival massage on dogs. The experiment should establish whether an increased tissue reaction against irritative forces can be obtained by gingival massage.

A systematic stroking, rubbing and kneading of the gingiva was carried out for two weeks either by hand or by massaging instruments. Healthy gingival tissues as well as those affected

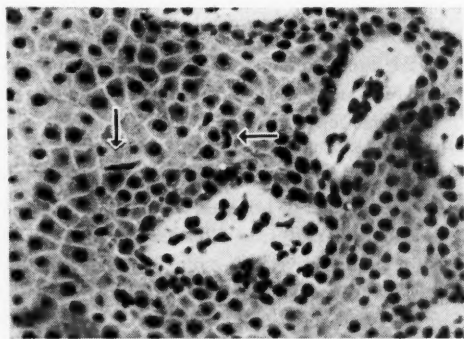


Figure 2 Infiltration of granulocytes in epithelial cells

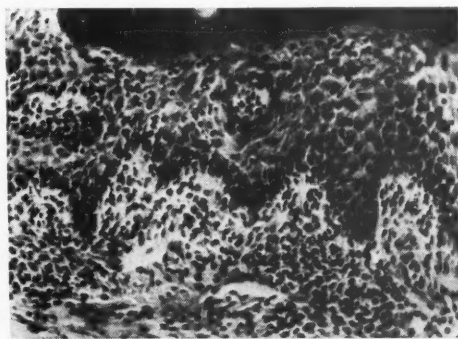


Figure 4 Mucous membrane of an alveolus; proliferation and vasodilation of the papillae

with periodontal disease were treated. Two thirds of the vestibular mucosa was massaged for five minutes daily; the third part remained untreated for control purposes.

After completion of the treatment, a histologic examination of all involved tissues revealed that the massaged gingival regions showed a strengthening of epithelial tissues, an increase in the histogenetic and mitotic activity in the subepithelial structures and an increased cell division in all tissues involved. The action and effect of medicated gingival massage in dogs seemed to be similar in both healthy and diseased tissues. No such alterations appeared in the control (unmassaged) regions.

This investigation seems to prove that mechanical gingival massage can be utilized effectively in the treatment and prevention of gingival disease because it produces reactivation and fibrinogenic activities in all regions involved. The defense mechanism grows stronger gradually, and a high degree of resistance to all types of irritating stimuli (especially bacterial invasion) can be obtained.

Tooth mobility, bruxism and selective grinding

Hans R. Mühlemann, H. Hirt and H. Herzog, Zurich. *A.R.P.A. Internat.* 14:1-7, 1955

Under normal conditions, periodontal structures are influenced constantly by the intermittent mechanical forces of masticatory and other oral muscles. The magnitude, rhythm, duration and direction of these forces depend on many interrelated and interacting components. A complete analysis of these factors, without distortion by experimentally produced variations, is difficult.

Previous electromyographic studies of the muscles of the masticatory system (Moyers, Pruzansky, and Eschler, 1949 to 1954) have contributed to the knowledge of oral muscle physiology. For the periodontist, however, the understanding of the active forces which influence periodontal structures is only a single part of a complicated problem. He is concerned mainly with the biologic reaction of the periodontal tissue to these forces. An evaluation of the reaction

of periodontal tissue to normal and abnormal muscle stress has been made possible by the introduction of tooth mobility measurement.

The magnitude of tooth mobility in single-rooted teeth depends on the following factors: (1) the length of the intraalveolar root portion; (2) the position of the rotation center in the intraalveolar root portion; (3) the variation of abnormal mechanical stress such as hyperfunction, dysfunction or parafunction; (4) the presence of marginal infections or inflammations, and (5) the action and reaction of biologic causative agents such as "bone factors."

The lengths of the intraalveolar portions of 343 roots were measured on dental films under identical conditions. The data obtained were compared with the corresponding tooth mobility values. The length of the intraalveolar root portion contributes to the magnitude of tooth mobility only to the extent of 33 per cent. Increased tooth mobility (or the pathologic values of tooth mobility) depends more on factors such as mechanical stress than on the length of the intraalveolar roots.

Artificial traumatogenic forces were applied to 34 single-rooted teeth for four hours. This mechanical stress was produced by interdental separating elastic bands. The tooth mobility was measured before, and four hours after application. It was revealed that abnormal (artificial) mechanical stress influences teeth and periodontal structures, and that periodontal tissues react within a few hours with an increase of tooth mobility. Elimination of stress is followed by decreased tooth mobility. Similar observations were reported in studies of the reaction of periodontal tissue to various forces applied during orthodontic treatments.

A 24 hour tooth mobility periodicity permits the detection of abnormal stress (Karolyi effect or parafunction) produced by masticatory (or other) muscle habits. Nocturnal bruxism produces tooth mobility increments of about 30 per cent. Elimination of bruxism, obtained by the insertion of bite-plates, is followed by disappearance of the nightly tooth mobility augmentation or by disturbances in the day-night rhythm.

Any disturbance in the equalized, symmetric and balanced distribution of masticatory and other oral muscle forces (hyperfunction, hypo-

function, dysfunction or parafunction) can produce changes in tooth mobility. Premature contacts and cuspal interference in central or lateral excursion are important causative factors of abnormal stress or dysfunctional force.

Selective tooth grinding also decreases tooth mobility. Its effects can also be evaluated by tooth mobility measurement.

The management of periodontal disease

Lowell N. Peterson. *J. California D.A.*

& *Nevada D.Soc.* 32:90-93 March-April 1956

As a result of the research of dental scientists and the observations of clinicians, there is much agreement in the field of periodontology. Modern periodontal practice is based on the following facts:

1. Etiologic factors do not act singly but are multiple, and in some instances remote and complex. Bacterial infection is secondary and has been overrated as a factor.
2. Pathologic manifestations are variable and early stages may be reversible.
3. An understanding of etiology and pathology determines the diagnosis.
4. The correct diagnosis determines the prognosis and dictates the treatment.

Becks has suggested a simple formula to evaluate the factors involved in the etiology, diagnosis and treatment. Becks' diagnostic triad consists of the following: (1) clinico-anatomical local findings, including those conditions occurring in the immediate environment of the periodontal tissues, such as calculus, food impaction, debris, faulty dental restorations, bacteria and poor oral hygiene, crowded teeth, and poorly contoured teeth; (2) clinicofunctional local findings, including conditions of the occlusion and articulation which favor trauma, such as high or steep cusps, interferences in centric, lateral or protrusive relations, biting habits, bruxism, lack of wear, poor bone structure, short or faulty root forms, missing teeth, open bite and unilateral mastication, and (3) internal or systemic findings, including those conditions and diseases which affect the body as a whole and which are reflected in the periodontal tissues.

A rational approach to treatment would be to establish good habits of oral hygiene and to correct local factors by operative means.

The periodontal pocket may be eliminated in several ways. Shallow pockets (3 mm. or less) may be shrunk through the usual procedures of scaling, polishing and massage. Pockets up to 4 mm. may be reduced by the use of caustics such as silver nitrate, phenol, trichloroacetic acid or sodium hydroxide. Surgery or gingivectomy is indicated when the pocket exceeds 4 to 5 mm. in depth, or where there is a large bulk of tissue.

The occlusion should be corrected by selective spot grinding and then by restorations, replacements, splints and other means. The patient's dietary habits should be studied and nutritional advice given. If adequate control or complete recovery has not been attained, constitutional factors may be present, and medical advice should be sought.



Endodontics

Devitalization with arsenic or immediate extirpation under anesthesia? (Arsen-Devitalisation oder Sofortextirpation in Anästhesie)

Walter H. J. Arnold. *Zahnärztl. Praxis* 6:3
Oct. 1, 1955

In dental literature, many reports emphasize the hazards and limited usefulness of arsenic or arsenic trioxide in devitalization of the pulp. Arsenic is extremely caustic, and when it contacts gingival tissues, serious and irreparable tissue damage occurs. Therefore, arsenic devitalization should be replaced by immediate pulp extirpation under local anesthesia. The danger of infection is insignificant, and the patient is spared psychic and physical injuries.

Immediate extirpation under local anesthesia is indicated when a healthy and intact tooth must be devitalized. In instances of a vital but carious tooth, the depth of the cavity and its relation to

the pulp must be ascertained roentgenographically. Often, capping can preserve the vitality of the pulp. The importance of preserving the vitality of the pulp should be explained carefully to the patient.

The immediate extirpation of the pulp under local anesthesia makes subsequent root canal treatment and permanent filling necessary. Temporary filling often endangers the tooth because a severe infection may occur. If pulpitis is present, extirpation of the pulp under local anesthesia is the method of choice. The patient's teeth can be treated and the root canal filled in a single appointment.

Because of their spirocheticidal properties, organic arsenic preparations are indicated for treatment of fusospirochetal infections. These arsenic compounds (arsphenamines) can be administered systemically or topically.

A study of the reparative powers of the mature dental pulp following partial amputation as a treatment for exposure by dental caries

Gilbert I. Brinsden. *Northwest Univ. D. Res. Bul.* 56:4-11 Dec. 12, 1955

A study of the reparative power of pulpal tissue after pulpotomy has been made. The formation of calcified bridges was investigated roentgenologically and clinically and substantiated where possible by histopathologic examination.

Pulpotomy was performed on 30 permanent teeth. In each tooth the vital pulp had been exposed as a result of carious invasion. The patients varied in age from 11 to 58 years. Group 1 comprised 27 teeth in which the coronal portion of the pulp was amputated at a level of approximately 1 mm. into the root canal. Group 2 comprised three teeth in which the affected pulpal horn only was amputated.

Two visits were required. At the preliminary visit the remaining carious dentin, if any, was removed and the cavity sealed with a sedative dressing of zinc oxide and eugenol. At the second visit, seven days later, pulpotomy was performed.

Irrigation of the operative field and control of postoperative hemorrhage was accomplished by the use of a saturated solution of calcium hydroxide in distilled water, the solution being injected into the operative field by means of a syringe. A blood clot was allowed to form prior to placement of the biologic wound dressing, which consisted of calcium hydroxide powder mixed with distilled water to form a paste of medium consistency. The dressing was covered with a thin layer of zinc oxide-eugenol paste.

Some time after the initial operation the tooth was opened up and the region of amputation investigated clinically to test for pulp vitality and to determine the presence or absence of a bridge.

Of 47 root canals investigated, roentgenologic evidence revealed the presence of 33 calcified bridges. Clinical evidence revealed the presence of 45 calcified bridges of which five were incomplete. There was 66 per cent agreement between the roentgenologic and clinical evaluation of evidence of bridging.

It would appear that clinical methods of evaluating bridging are superior to roentgenologic evaluation. Complete bridging was confirmed histologically by serial section in three teeth. The incidence of postoperative pain was 7.4 per cent.

In Group 1 some calcium hydroxide remained in all cavities at the time of clinical investigation. This observation is contrary to that made by Teuscher and Zander. The explanation probably lies in the fact that large amounts of the wound dressing were used and that only a certain proportion of the dressing was utilized by the pulpal tissue. The remaining calcium hydroxide was in most instances discolored and moist.

The mature dental pulp retains much of its potential for healing.

Prosthetic dentistry



Crown and bridge

The pivot crown (Zur Stiftzahnkrone)

U. Heintz. *Deut.zahnärztl.Zschr.* 10:1868-1871
Dec. 15, 1955

The construction of pivot crowns involves both a technical and a biologic problem. The biologic consideration, however, is more important than the technical, especially in regard to tooth therapy in which the histologic structure of dentin must be considered.

In root treatment, success or failure is not dependent on the method or quality of the therapy alone but on individual reactions in the involved regions. Such a characteristic reaction, locally and temporarily changeable, corresponds to the total reaction of the human organism.

The indication for construction of a pivot crown (or other dental prostheses) is only a small part of the complicated problem. The use of

nonvital teeth or teeth in which any root therapy has taken place previously as an anchorage for bridges is contraindicated.

Histologically, the studies by Black, Driak, Jung and the author revealed that the dentin consists of a highly elastic and compressible substance. When the dentin is compressed to a degree above the limit of its elasticity, deformation begins. The capacity of dentin to resist compression varies individually (Jung). Under a pressure of 14 kg. to 1 sq. cm., deformation of the dentin occurs, especially when the enamel cover is not intact.

Most of the previously used methods for preparing tooth stumps for pivot crowns were inadequate. A more efficient order of procedure, and tools better adapted to meet the clinical specifications, are necessary. There is a lack of rotating instruments properly designed to reduce hard tissue in the region of the created axial line angles. Therefore, the whole crown of the tooth is often cut to the very root to form an even vertical plane. The completed axial walls of the preparation, however, must conform to the horizontal circumferential anatomy of the tooth.

The selection of a suitable disk, regardless of whether the core is rigid or flexible, is always a problem; a diameter sufficient to grind or cut the surface of the occlusogingival part of the pivot crown preparation will be useless for extensive use subgingivally because of the constant

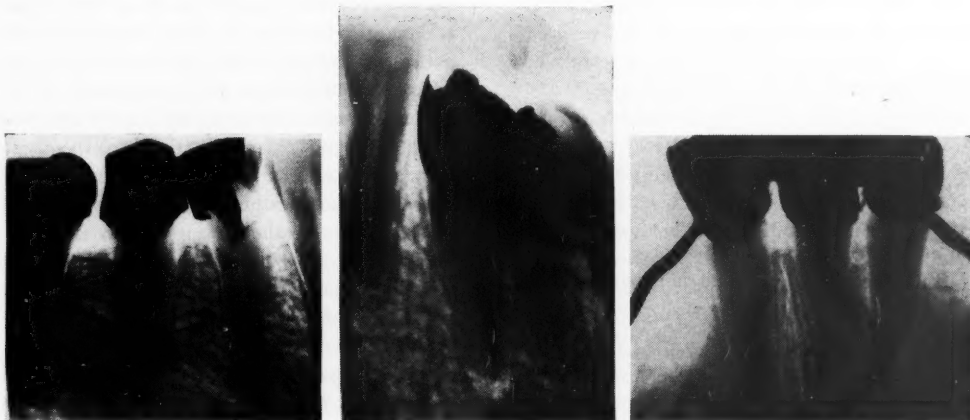


Figure 1 Left: Pivot tooth with inadequate root filling. Center: Pivot tooth with inadequate root filling which caused development of granuloma. Right: Prepared root with crown stump. Mathé crown with pivot



Figure 2 Three Mathé pivot crowns

danger of injuring the gingiva with the edges of the disk.

In pivot crowns without a ring-shaped enclosure, either breaking of the pivot or a gradual extruding of the tooth occurs, caused by deformation in the anterior surface of the tooth root. Simultaneously, a posterior fissure may appear.

The ring-shaped enclosure, however, does not conform to esthetic principles.

The solution of this difficult problem consists in preserving the healthy parts of the natural tooth crown, and in constructing and applying Mathé's open-faced crown to which the pivot is added. Such a procedure forestalls damage to the proximal surface of adjoining teeth, does justice to the histologic resistance of dentin and achieves the desired esthetic effect.

Pulpless teeth undergo severe alterations in the course of time. The elasticity of dentin decreases, and it becomes as friable and fragile as glass.



Complete dentures

Technic for recording the bite in edentulous persons

(Una técnica para el registro de la mordida en los desdentados completos)

P. Saizar. *Rev.A.odont.Argentina* 44:1-12
Jan. 1956

A technic for recording the bite in edentulous patients is as follows:

1. Functional impressions are taken in individually prepared trays, and models of resistant artificial stone are made.

2. The bite plates are constructed in base-plate wax, reinforced with wire and provided with occlusal rims of modeling compound on which the bite is to be recorded. They are over-extended slightly so that they can be trimmed if necessary.

First, the upper bite plate is placed in the mouth; it is checked as to length and as to whether it lifts the upper lip enough. The occlusal plane of the upper bite plate is established slightly below the upper lip, when this is at rest, and parallel to Camper's plane. The occlusal plane of the lower bite plate is established by the changes of the patient's facial expression and his subjective signs while the bite is being recorded. When the lower bite plate is placed in the patient's mouth, without removing the upper bite plate, and the patient is asked to bite on the rims, his facial expression may be one of muscular strain caused by greatly increased vertical dimension. If so, the lower bite plate is then removed, the occlusal surface of the rim is slightly softened by heat, the height of the occlusal rim is reduced by slight trimming, the plate is placed again in the mouth and the patient is again asked to bite on the rims in centric relation. The facial change registers improvement of the vertical dimension and of occlusal relations. The plates are corrected by trimming or by adding material.

When this procedure of diminishing gradually the height of the lower rim and either trimming or adding material to the bite plates is repeated, the patient's facial expression changes, first, to an expression of inattention (this corresponds to the vertical dimension of physiologic rest) and then to an energetic expression (this corresponds to the correct vertical height of occlusion). As for the external facial esthetics, this height will give a satisfactory aspect because it permits facial expressions of physiologic rest and occlusion that are like those of a person with a normal face and with normal dental arches in occlusion. The correctness of the occlusal height is verified by the size of the opening of the freeway space between occlusal rims (not less than 1 mm. or more than 4 mm.) and by the perfect pronunciation of the letter "m" with the occlusal rims in position.

Steps are then taken to improve facial fullness and the form and expression of the lips. The classical labial lines are marked on the occlusal rims for further orientation as to the size, alignment and location of the artificial teeth. The centric relation of occlusion of the bite plates is registered with the models in the articulator, after the bite plates have been lined with a zinc oxide-oil paste. It is registered with a simple device which is fixed to the upper bite plate by a central screw and which has an adaptation for stylus tracing in the lower bite plate.

While the recording device is fixed in the occlusal rims, one of the rims (and only one) is trimmed so as to diminish its height by 3 mm. Then some grooves are made on the sides of the rim for future use. The recording plates ready to be placed in the mouth have the following characteristics: (1) exactly the same height which was previously determined in the patient's head; (2) perfectly adjusted bases to the models and (3) vertical pressure which on the occurrence of centric relation will be distributed evenly on the residual ridges. Centric relation is secured, when the bite plates are replaced in the mouth, by recording the gothic arch. Nonforced centric relation at the previously established occlusal height occurs exactly when the recording needle occupies the vertex of the gothic arch while the patient is exerting minimal occlusal pressure to have the plates in contact. The mandible is maintained in this position of centric relation by means of an isolator of the vertex of the gothic arch, which prevents mandibular movement during the time which is needed to have the articulation plates fixed in a position of centric relation.

Immobilization of the mandible is obtained by means of key pins of modeling compound, which are secured to the grooves made previously on the sides of the occlusal rims. After the articulation plates are fixed in the mouth in a relation which corresponds exactly to centric occlusal height, there remains nothing more to do for reproducing vertical dimension in the articulator than to detach the upper model and to fix it again in the articulator in its exact position. In the case reported the articulator was fixed at 33 degrees of sagittal condylar inclination and at 15 degrees of transversal trajectories. With this technic the point of contact while centric occlusion is re-

corded should be central for both jaws. This condition points out the limitations of the method, which cannot be used in instances of pronounced asymmetry or in instances of great protrusion or retrusion of one of the jaws.

Alterations in the mucous glands caused by complete upper dentures (Schleimdrüsenveränderungen durch Gaumenplatten)

Eugen Fröhlich and Willy Masshoff.
Deut.Zahn Mund Kieferhk. 22:345-358
Sept. 1955

Wearing of complete upper dentures sometimes produces unfavorable secondary reactions such as degeneration of the small mucous glands on the roof of the mouth. The epithelial cells in these glands atrophy. Hyperplastic inflammation and an increase of interstitial fibers occur, followed by true cicatrization.

Pyogenic inflammation appears around the edge of the lesions of the mucous membrane caused by constant pressure exerted by the dentures. Frequently such disturbances in the oral cavity recede without severe clinical symptoms, despite the fact that an irreparable injury to vital tissues has occurred.

A clinical examination of 28 wearers of complete upper dentures revealed that alterations of the mucous glands occurred in 25 patients. In the control group of 22 persons with a healthy natural dentition, only a single instance of sclerosis was observed.

The type of material used in the construction of the dentures did not play a significant part in the development of the pathologic symptoms. Obviously, these disturbances were caused by constant functional and mechanical forces which produced a secretory congestion of the excretory glandular ducts.

It is possible that the modern precision impression technics result in complete dentures that fit too firmly, thereby causing an increasing disturbance of the glandular secretory discharge.

The only possible correction is the removal of complete upper dentures during the night, to reduce potential damage to a minimum.

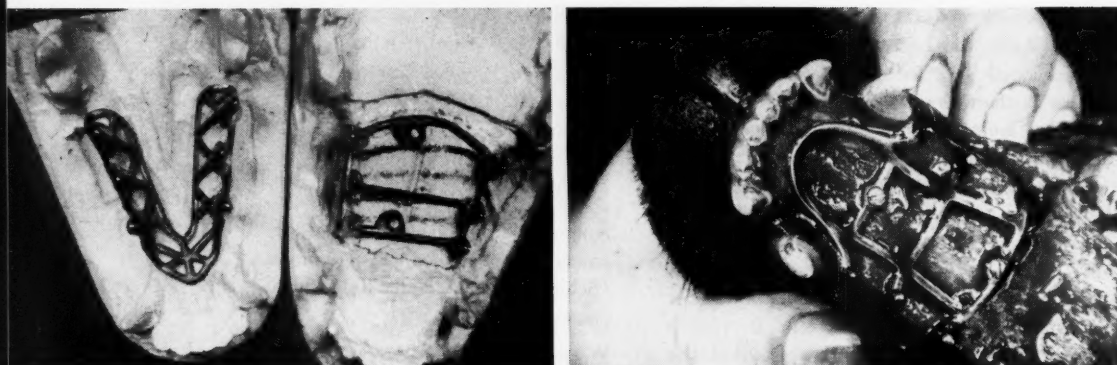


Figure 1 Left: Palatal and lingual subperiosteal connectors in maxillary and mandibular premolar implants in dog. Right: The maxillary premolar implant secured by two screws for primary fixation

Oral surgery



Plantation

Canine experimentation with subperiosteal prosthodontic implants

Roy L. Bodine, Jr. *J. Implant Den.* 2:14-19
Nov. 1955

Animal experimentation has an important place in the research relating to implant dentistry, because the histology and pathology of the tissue surrounding the penetrating abutments and the bone under the implant substructure can best be studied in a laboratory animal. Of the commonly available animals, the dog is best; preferably a medium sized dog weighing between 25 and 40 pounds.

The ideal place for implants in dogs is the premolar region. Dogs usually have three upper and four lower premolars on each side which have little function between the tearing canines and the crunching molars. The premolars are extracted in the experimental dog. After the extraction wounds have healed for from 6 to 12 months, an alveolar bone impression can be

made. Subperiosteal mandibular and maxillary multiple-tooth premolar implants are made. The substructure of the lower implant should pass lingually to the anterior teeth. The upper should be a palatal implant with three crossbars secured by two screws in the midline. The metal teeth are positioned to be just slightly out of occlusion.

The first subperiosteal palatal implant done by the author in a dog was a successful experiment. The implant was of heavy, rigid construction and cast in surgical Ticonium. Healing was exceptionally rapid. The implant was in place almost a year, during which time numerous tissue sections and exploratory operations were made around the posts, the screws and the crossbars. On its removal, connective tissue was found between the implant and the bone in all regions. Where the implant palatal struts had been exposed by previous sectioning, epithelial tissue had formed between the struts and the underlying bone. The portions of the implant which were covered with tissue were bright on their underside. Only where the metal was exposed did salivary deposits form and discolor the under-surface of the implant.

In a subsequent experiment, on surgical elevation of the mucoperiosteum such a snug fit of the mandibular implant against the bone was obtained that screws or circumferential wiring for primary fixation were not considered necessary.



Figure 2 The mandibular premolar implant secured by circumferential wiring to compare results

One week later it was discovered that on the right side the implant had slipped from place. Implants in dogs must be secured by screws or by circumferential wiring.

In a current experiment, maxillary and mandibular implants have been inserted in an edentulous dog. Screws were used in the upper Ticonium implant and circumferential wiring in the lower Vitallium implant.

No definite conclusions should be drawn from experiments with dogs regarding subperiosteal prosthodontic implants in human beings. The dog's masticating mechanism and its function, the lack of oral hygiene, the rapid healing after surgery, and the tissue resistance are not comparable to those of man. Some histologic studies can be undertaken on the dog which would be impossible in the human subject.

The present status of implantation (Implantaciones. Su estado actual)

Angel Guergué. *Odontoiatría, Madrid* 12:499-503
Sept. 1955

In prosthodontics, metal and acrylic resin implants have been placed in fresh or surgically created alveoli, for use as abutments for fixed bridges. Authors such as Waerhaug and Steen have stated that acrylic implants do not irritate either soft or hard tissues and that they are so well tolerated that they are eventually surrounded by an epithelial lining that prevents

penetration of bacteria. This is difficult to accept, especially if the implant is subjected to the strain of carrying a crown or supporting a bridge.

Waerhaug and Zander implanted 34 teeth in dogs. When each tooth had been driven into its socket, the tooth was cut off flush with the gingival margin. The dogs were gradually sacrificed between one week and several months.

Normal healing was observed. Some implants remained firm, others did not; of these, 14 fell out spontaneously in 23 to 129 days.

Some implants had been roughened and others polished; some had been sterilized in antiseptics, others not. There was no noticeable difference in their behavior.

The strains to which an incompletely buried root implant is submitted are too great to expect it to withstand the load imposed by a crown or bridge. A definitive failure perhaps could be predicted for any such attempts.

In exodontics, transplantation has led to the creation of tooth banks, built up with extracted supernumerary teeth and impacted third molars. Every tooth has its chart with anatomic characteristics and roentgenograms, plus the patient's blood count, pH, and Wassermann and Kahn test results.

The recipient's case history is prepared; this history includes blood count, blood pressure, coagulation time, sedimentation rate, urinalysis results, condition of endocrine glands, and a roentgenographic study of the transplantation region.

With adequate transplantation, healing takes place in two weeks, when the patient can masticate with his new tooth without the aid of a protective acrylic splint. Two to four months are necessary for new bone to surround the transplanted root.

Most failures are due to round cell infiltration, which gradually produces a resorption of the roots.

Transplantation is not acceptable in prosthodontics or exodontics, as such costly surgery is not justified by the poor results obtained.

▼
Surgical pathology

Naso-labial cyst

R. Venkata Rao. *J. Laryng. & Otol.* 69:352-354
May 1955

A cyst pushing forward the junction of the ala nasi with the upper lip has been described variously as fissural cyst, mucoid cyst of the nose, maxillary cyst, cyst of the nasal vestibule, cyst of the nasal floor, cyst near the nose and naso-alveolar cyst. These various names, when considered together, enable the location, origin and the clinical features of the cyst to be visualized.

This cyst is not frequently seen in the ear, nose and throat clinics. Among 250,000 new patients in 20 years, only nine cases of nasolabial cyst were recorded. Zuckerkandl reported the first case in 1882; and since Arnoldi's report in 1929, the total number of such cysts in the literature does not exceed 120. The cyst is not met more often perhaps for the following reasons:

1. It is situated on the surface of the alveolus; therefore, the dental and oral surgeon is consulted. Two of the nine cases were referred from the dental department after some treatment.

2. The cyst grows very slowly, painlessly and unless it causes disfigurement by lifting up the ala of the nose, or nasal obstruction by narrowing the anterior nares, through lifting up of the floor of the vestibule, the patient does not seek medical aid. Only one case belonged to this group.

Infection of the cyst by accidental trauma or deliberate surgery, such as aspiration or incision, has been the main feature of the remaining six cases. The infected cyst presents all signs and symptoms of furunculosis of the nose or alveolar abscess.

Clinical features include the following: (1) a unilateral swelling gradually obliterating the nasolabial fold, pushing forward the ala nasi, projecting into the floor of the nose from beneath and on the lateral side, and sometimes into the buccal cavity through the gingivolabial fold; (2) the

swelling is painless unless recently infected, and if a fistula forms it invariably drains through the nose; (3) the swelling is not in the midline or related to the base of the nasal septum; (4) it is cystic to the touch and slightly mobile by bidigital examination, and (5) it is not covered by bone.

The teeth—incisors and cuspid—in relation to the swelling are correct in position and number and not distorted in projection or alignment.

Roentgenologic examinations reveal nothing abnormal. Differential diagnosis includes the following: dental cyst, dentigerous cyst, embryonic swellings arising in the midline of the nose, furunculosis of the nose and acute alveolar abscess.

Through sublabial approach the entire cyst is excised. The cyst wall is well demarcated, and only when there is a history of recurrent infection of the cyst, the cyst wall is found adherent to the surrounding tissues, more so to the floor of the nose. When the cyst is removed, it is found to have been resting on the alveolar bone, which is smooth and sometimes appears like a polished fovea, perhaps the result of continuous pressure of a slow-growing cyst. The cyst was never found to cross the midline of the nose.

Of the nine patients, eight were women and one was a man. The average age was 36 years, the youngest being 18 and the oldest 46. Seven of the cysts were on the left side, two on the right side. There was a history of infection of the cyst in six instances, and a history of previous surgical interference in three instances.

The cyst has a well-defined capsule, fibrous in nature, with loose connective tissue. The lining is epithelial, cuboidal in some regions and squamous in others. In the larger cysts, the squamous epithelium is more predominant. In cysts that have been infected, there is cellular infiltration in several regions, with erosion in some regions and granulation tissue.

As to the origin of these cysts, there are two theories. Klestadt holds that "the cyst arises from an inclusion of ectodermal tissue in the lateral nasal cleft, occurring during the course of the embryological development of the face." The second theory as advanced by Peter, Tuffers and Monesi and supported by animal experiments, is that the cyst arises from an anteriorly misplaced lacrimal duct.

Hemophilia: establishment of diagnosis

Ingram W. Ogden. *Oral Surg., Oral Med. & Oral Path.* 8:1245-1249 Dec. 1955

A 19 year old white seaman hospitalized for dental extractions necessitated by carious teeth revealed a past history indicating a hemorrhagic diathesis. Since repeated clinical and laboratory tests were normal, he was transferred to the U.S. Naval Hospital, St. Albans, N. Y., for further evaluation.

The history revealed bleeding tendencies in two of five brothers and in the maternal grandfather. The patient had previously bled excessively after the extractions of teeth.

The results of the laboratory examination were within normal limits. In view of the fact that the patient had apparently had no bleeding episodes from other wounds, it was surmised that he could withstand the extractions without difficulty. The hematology clinic concluded that a hemorrhagic diathesis was not demonstrated, and it was recommended that the extractions be accomplished without benefit of preoperative medications or transfusions so that the postoperative course could be observed.

The maxillary incisor teeth were extracted. A rubber-covered pack, consisting of a gauze pad folded and placed in a sterile condom, was placed in contact with the wound and held in place by the lower teeth. The patient was observed for 30 minutes and the hemorrhage was well controlled. There was only slight oozing at the line of closure. On the inadvertent removal of this pack during the first night after the operation, the oozing increased slightly. When it persisted, a modeling compound splint was constructed and applied; it seemed to control the hemorrhage and was kept in place for five days. On the seventh day after the operation, the splint was removed and there was no evidence of coagulation. The oozing persisted and the wound appeared as fresh as on the day of operation. At this point 500 cc. of fresh whole blood was given, and five hours later the oozing was almost completely stopped. After a second transfusion, a biopsy specimen of the gingival mucosa was taken, and proved normal. The sutures were removed and normal healing took place.

The patient was returned to the hematology clinic, and further efforts were made to establish a diagnosis. A repeat laboratory assay of the patient's hematologic status showed a prothrombin time of 13 seconds with a control of 13 seconds, and a prothrombin consumption time of 16.5 seconds with a control of 47 seconds. (In the earlier assays the prothrombin consumption time had always been above 25 seconds and, therefore, had been considered normal.) A further study indicated that the patient's abnormal prothrombin consumption time (a reflection of a deficiency in the thromboplastin complex) was a result of a lack of antihemophilic globulin and possibly of plasma thromboplastin antecedent.

Because of his hemophilia, the patient was separated from the military service. He was advised that in the event of any surgical experience, dental or otherwise, measures should be taken to control hemorrhage with fresh frozen plasma or fresh whole blood.

According to Quick, "The diagnosis of hemophilia depends on the triad: (1) a persistent bleeding tendency in the male beginning early in life, (2) a deficiency of thromboplastinogen in the blood, and (3) a characteristic hereditary pattern."

Present trends in the management of cleft lip and cleft palate

Robert H. Ivy. *West.J.Surg.* 63:60-65 Feb. 1955

Cleft lip and cleft palate cause defective speech, unsightly appearance, dental malocclusion and social maladjustment, so that those subject to it are to be regarded as cripples, just as much so as those suffering from the effects of poliomyelitis, cerebral palsy and other more widely publicized disturbances. Management of cleft lip and cleft palate requires not only plastic surgery but the full cooperation of the pediatrician, the otolaryngologist, dental specialists, the psychologist and the speech therapist, working as a team to plan and carry out treatment.

Examination of birth certificates in the Bureau of Vital Statistics of the Pennsylvania State Department of Health revealed that approximately 300 children are born in the state each year with

cleft lip or cleft palate, or both. This means that one child in 760 is born with some type of the deformity. A tabulation of congenital anomalies as recorded on birth certificates in Pennsylvania in 1949 places clubfoot at the head of the list with 437; cleft lip and cleft palate second with 300; spina bifida, 182; polydactylism: fingers, 150, and toes, 44; hypospadias, 95; hydrocephalus, 69, and congenital heart disease, 59. From these figures it is evident that cleft lip and cleft palate are among the commonest congenital anomalies.

The person with cleft palate may become a drain on the community unless he can be made self-supporting to the extent of his abilities. The possibility of complete rehabilitation of persons with cleft lip and cleft palate is generally much greater than that of persons who have had poliomyelitis or cerebral palsy; yet, whereas millions of dollars are being collected and spent each year for sufferers from these two latter conditions, public interest is not fully awakened to what can be done for instances of cleft lip and cleft palate.

The effective rehabilitation of persons with cleft palate and its associated handicaps is a long and expensive process, frequently beyond the means of the individual family. Consequently, the community, whether it be local or state, has a responsibility toward these people to assume that part of the financial burden which they are unable to bear. By proper rehabilitation the majority of these persons can be placed in a position to earn their own living, instead of being a financial liability to the community.

When a child is born with a cleft lip or cleft palate, the entire problem should be explained to the parents, with an outline of the treatment necessary over a period of perhaps several years, an optimistic outlook being emphasized. Parental cooperation is essential if the best results are to be obtained for the child.

In newborn babies with cleft lip alone or combined with cleft palate, after psychologic conditioning of the parents, immediate surgical closure of the lip cleft is often demanded. Frequently, the physician who has delivered such a baby is under the impression that immediate closure of the cleft is imperative to allow the baby to nurse, and that without surgical closure starvation is

imminent. Nothing is more erroneous. The surest way to kill a baby in a poor condition of nutrition is to operate on it. No operation should be done until the child begins to gain weight and is otherwise in good physical condition. By the use of a little ingenuity and patience, feeding can be carried on by medicine dropper, spoon or special feeder.

When the time approaches for something to be done about the major cleft of the palate, the patient should have the benefit of consultation by a group of the previously mentioned specialists. Any surgical closure of the palate should have as its main objective not mere creation of a partition between the mouth and the nose but the formation of a velopharyngeal sphincter; otherwise, the validity of surgical treatment is debatable. The general dental care is perhaps more essential in patients with cleft palate than in children with normal mouths. The dental prosthetist, the orthodontist and the speech therapist can perform a great service in joining to achieve the most satisfactory results.

Weekly clinicopathological exercises: Case 42021

Benjamin Castleman. *New England J. Med.*
254:70-73 Jan. 12, 1956

A 12 year old girl was admitted to the Massachusetts General Hospital because of swelling of the right side of the mandible. Progressive enlargement of that region, beginning 18 months previously, had been noted, at which time the right first and second mandibular molars had been extracted. Biopsy of the mandible was reported to have shown chronic osteomyelitis. An impacted right third mandibular molar had been extracted 14 months before admission, and two months later a bite plate was made to relieve pressure on the right side of the mandible by the maxillary teeth. When the right first and second maxillary molars had been extracted five months before admission, the bleeding was excessive. A pronounced increase in size of the mass was noted during the four months before admission.

Physical examination showed a well-nourished girl with facial asymmetry caused by a large mass

on the right side of the mandible. There was no lymphadenopathy. Prominent veins were noted in the skin overlying the mass. Oral examination revealed a hard, nontender mass measuring 8 to 10 cm. in its largest diameter. The gingiva overlying the mass was not ulcerated and appeared whitish pink. The dental hygiene was good, and the teeth were in good repair. Roentgenograms showed a diffuse, progressively expanding lesion involving the ascending and horizontal ramus of the right side of the mandible to the region of the second bicuspid. The bone appeared rarefied and contained irregular bony septa traversing it. All the right mandibular molars were absent except for an impacted molar which was lodged in the ascending ramus and extended into the coronoid process. This tooth was removed subsequently.

Kurt H. Thoma, presenting the differential diagnosis, suggested angioma of the mandible or a fibrous dysplasia. The clinical diagnosis had been fibrous dysplasia. The anatomical diagnosis was hemangioma.

The tumor was resected, and its bulk was found to be composed of angiomatous foci. Forewarned by a report of massive bleeding on biopsy, the surgeon had ligated the external carotid artery at the outset. The resection of the tumor was completed without undue difficulty. There were no complications. The patient has excellent function and not a bad deformity.



Anesthesia and analgesia

The return of hypnosis

Editorial. *Indust.Med.&Surg.* 25:200
April 1956

There are signs that hypnosis is being revived in the medical worlds after having fallen into the hands of too many pseudoscientists and entertainers.

One evidence of wider espousal of hypnosis in scientific dentistry and medicine is the appearance of seminars conducted by qualified speakers and demonstrators in the meritorious use of hypnosis. One recent seminar for dentists discussed

"preparation of the patient, opportunities for use of hypnosis as with phobic patients, psychosomatic dental problems, therapeutic uses, operative use, anesthesia, patient management, control of bleeding, salivation, speeding of healing, control of gagging and bruxism, hypnosis with children."

It is the duty of the physician and the dentist to prevent and to relieve pain and anxiety. Always, the simplest and the safest is the method of choice. If hypnosis becomes the method of choice, then it is to be embraced, applied and extolled. If hypnosis is to have an honored place in medicine and dentistry, its practice must be confined to the precisely skilled. Hypnosis is not for dabblers.



Surgical techniques

Surgery of the mandible

Bernard G. Sarnat and Irwin B. Robinson.
Plast.&Reconstr.Surg. 17:27-57 Jan. 1956

An understanding of normal growth of the mandible forms the basis for early recognition and proper surgical treatment of some deformities. Mandibular growth is a result of an integration of activities in a number of regions. Two types of bone growth occur in the following principal regions: (1) appositional, at all free borders, with the exception of the anterior border of the ramus, and (2) epiphysial-like growth at the condyle. Concurrently there is continuous surface remodeling. Normal development of the mandible depends on the synchronistic growth activities of the various centers. Any interference affecting the growth centers alters the orderly progression of development and results in some type of mandibular deformity.

The most important growth site of the mandible is the condyle, where cartilage is replaced by bone. This growth center influences growth of the ramus in height and width. Growth in length of the body of the mandible occurs principally at the ramus as a result of apposition of bone at the posterior border and resorption at the anterior

border. The mandibular body increases in height by eruption of the teeth and deposition of alveolar bone. The little increase in size occurring in the rest of the mandibular body is achieved by surface apposition of bone.

Mandibular deformities can be classified into those in which the mandible is larger or smaller than normal. Many of these deformities can be treated best by surgical means.

In the growing mandible, resection of the mandible will sharply affect its growth. Thus, the resulting deformity will be one not only of loss of tissue but of loss of a growth site. This additional deformity may be superimposed on the old one. Loss of the teeth will affect the growth of alveolar bone.

In the adult, since the mandible has attained full growth, resection will create a deficiency of only that which is removed. Thus, surgical reconstruction in the adult mandible is concerned with the maintenance of the position of the fragments and replacement of the lost tissue.

Free simultaneous transplantation of bone into the lower jaw with the operative wound and the oral cavity in temporary communication

V. A. Dunayevsky. *Stomat., Moscow* 6:35-36
Nov.-Dec. 1955

Free transplantation of bone into a defect of the lower jaw while direct communication exists between the oral cavity and the operative wound used to be considered impossible. The antibiotics have permitted suturing oral mucous membrane injured in the preparation of a bed for the transplant. They also permit transplants of bone into granulated wounds and preparation for such transplantation in the correction of microgenia by the cutting through of the oral mucous membrane.

Experience with 24 instances of free transplantation of bone into the lower jaw, with the operative wound penetrating into the oral cavity, is reported. Of the series, seven involved subperiosteal division of the lower jaw for extirpation of adamantinomatous; four operations were for the correction of microgenia, and the remainder for

the correction of defects resulting from gunshot wounds.

Although the literature carries few accounts of surgical correction of long-standing gunshot defects of the lower jaw, the management of such operations has changed considerably. At one time, to restore the continuity of the lower jaw, the jaw fragments had to be orthopedically or surgically realigned. This involved dissecting all the scarred skin and mucous membrane adjacent to the defect, often establishing a sizable communication between the operative wound and the oral cavity. Bone transplantation used to be done in a second stage, after the skin and the mucous membrane had been sutured together.

Now the jaw fragments may be bolted extraorally, without danger of suppuration of the communicating wound. The jaw fragments are bolted and a free transplant is introduced simultaneously to fill the defect. The external layer of the seventh or eighth rib is resected for transplantation, the dimensions having been calculated in advance. The cicatrices are then excised and the jaw fragments aligned, and a bed is prepared for the bone graft. Mandibular tissues are dissected layer by layer, denuding the ends of the jaw fragments, which are divided from the cicatrix. An opening into the oral cavity is thus created.

The cortex is removed from the ends of the bone fragments, which are bolted 1.5 to 2 cm. from the edge. With the jaw fragments in proper relation, preferably with hypercorrection, they are then reinforced with a series of metal bolts and nuts. Tissues at the depth of the wound and contiguous with the buccal mucous membrane are sutured with catgut. If the tissues at the edges of the wound are taut, corrective local plastic surgery may be carried out. After the wound from the oral cavity is walled off, the bony transplant is placed against the ends of the fragments, and the wound is closed with a layer-by-layer suture after the introduction into the wound of 300,000 units of penicillin powder. For the first three days, intramuscular injections of 50,000 units of penicillin are given every three hours.

An illustrative case, involving the correction of a facial gunshot deformity treated eleven years after injury, is reported. The metal reinforcements were removed six weeks after the operation, and a lower denture was fitted. The continuity of the

jaw and the shape of the face were restored. In only 1 of the 24 operations has postoperative supuration been a problem, and it resulted from failure to note a tooth with a gangrenous pulp. The method of management described has proved effective and efficient in correcting gunshot defects of the lower jaw.

Correction of facial deformities caused by lupus or carcinoma (Beispiele der Deckung von Gesichtsdefekten nach Lupus und Karzinom)

C. A. Honig, Utrecht, Netherlands. *Fortschr.Kief. Ges.Chir.* 1:247-249, 1955

Lupus or carcinoma frequently causes severe facial deformations not only of the skin but also of subcutaneous, cartilaginous and muscular tissues, and sometimes of the osseous structures as well.

When those defects appear in the nasal and oral regions, tracheostenosis occurs. The reconstruction of a completely decomposed nose, its covering and that of the involved labial parts can be accomplished through the plastic ribbon flap method, utilizing parts of the frontal lobes. In more severe deformations, when complete decomposition of the nose is accompanied by the destruction of upper and lower lips, the round ribbon flap technic should be used. Rebuilding of supporting parts such as ala and columella nasi can be achieved by the implantation of costal cartilages.

The restoration of the labial function and the sphincter mechanism of the mouth can be obtained by a fascial band from the lower lip which is anchored on both sides to the remaining facial musculature. Although this procedure will achieve the desired normal contact between the lips, the deformation of the lower lip, remains unchanged. The lower lip not only is drawn in an upward direction but also to a posterior position, severely distorting the patient's facial expression.

Case 1. The patient, a 50 year old woman, had lost the major part of her nose through carcinectomy. One year after the surgical intervention, no

recurrence of the carcinoma appeared, and a complete nose repair was achieved by plastic surgery in three stages. In the first phase, the nasal vestibule was covered with ribbon flaps from the cheek. The other nasal parts were rebuilt with frontal lobes. In the second phase (after 14 days), the pedicle of the frontal lobe was divided, and by partial excision again connected to the forehead. In the third phase (after two months), the plastic nose was formed by wedge-shaped excisions in epidermis and subcutis around the point of the nose. The result achieved was esthetically and functionally favorable.

Case 2. The patient was a 55 year old man whose nose was distorted by "butterfly" lesions and ulcerations, characteristic of lupus erythematosus. Both nostrils and the mouth were constricted. A carcinoma of the chin also was present. The repair was obtained with thoracic circular pedicle flaps. In the first stage, an acromi thoracic circular tube (Gillies) was modeled, and by displacement of the flaps, the widening of both nostrils was achieved. In the second stage (after 14 days), the carcinoma and the lupus lesions and scars were eliminated. The lower lip was rebuilt with the thoracic end of the circular pedicle flap. In the third stage (after 14 days), the nasal vestibule was remodeled with cutaneous flaps from the cheeks, and the nose was covered with the acromial end of the circular tube.

In the fourth stage (after 14 days), the circular tube was removed from the base of the remodeled nose, and, after excision of the last lupus scars, the lower lip was reconstructed using the middle part of the circular tube. In the fifth stage (after three weeks), displacement of the flaps produced adequate corners of the mouth. In the sixth stage (after three months), the nose received its definite form. The lupus lesions and cicatrices had distorted the shape of the lips, making the insertion of a necessary dental prosthesis almost impossible. Inlays in both lips improved this condition. Finally, the function of the lips was restored with fascial bands, and the esthetic appearance of the patient's face was satisfactory.

Basic science



Anthropology

Ideal dental occlusion in the PrimatesJ. R. E. Mills. *D. Practitioner* 6:47-63 Oct. 1955

The dentition of the Primates is important for two reasons: (1) because it has remained remarkably generalized, and (2) because Primates is the order to which man belongs, and findings in the other Primates may, in some cases, be applicable to man. A report is presented of examinations and detailed drawings of the dentition of representatives of every family and subfamily of the Primates, with the exception of Daubentonia—the aye-aye of Madagascar. Following are the conclusions reached:

1. There is a common pattern of chewing throughout the Primates, including man.

2. Chewing consists essentially of two phases. One, called the buccal phase, corresponds to the rotation of the mandible about a point within the condyle of the same side; the lower buccal cusps slide in the grooves between the upper buccal ones, and similarly the lower lingual cusps slide between the upper lingual ones.

3. The jaws pass through the centric position, into the lingual phase of occlusion, which corresponds to the rotation about a point within the opposite condyle. Here the lower buccal cusps normally slide down the buccal face of the upper lingual cusps, although there are differences of detail in the Old World monkeys.

4. The two phases of occlusion occur simultaneously on opposite sides of the mouth, thus producing a balanced occlusion.

5. In man, owing to the narrowness of the upper dental arch compared with the lower, the upper molars lean buccally and the lowers lingually. This is the reverse of the situation

seen among the lower Primates. In order that the teeth on both sides of the mouth shall remain in contact during lateral excursion, it is necessary for the mandible to tilt laterally.

6. The articular eminence is a device to enable this to take place in man.

The two phases of occlusion were found in the gorilla, an advanced Primate, in the Tupaia, the most primitive of the Primates, and in representatives of every family and subfamily in between. There is a balanced occlusion in each instance, and the pattern of wear facets is essentially the same.

In all the groups of Primates the pattern of chewing is essentially the same, consisting of rotation of the mandible about the two condyles alter-

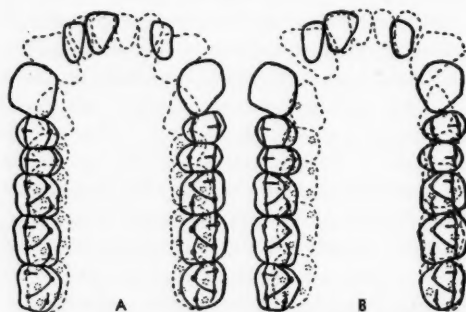


Figure 1 Plan view of the complete upper and lower dental arches of gorilla, superimposed. Left: In centric relation. Right: In lateral excursion to the right

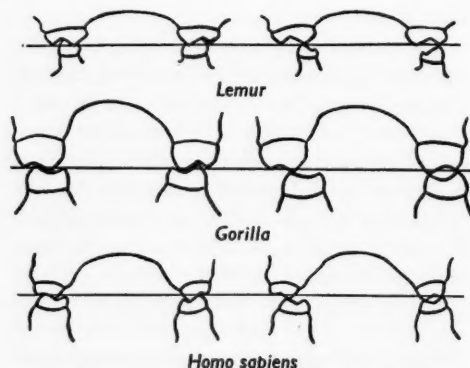


Figure 2 Cross section through the first molars of lemur, gorilla and *Homo sapiens*, at the level of the hypocond of the lower first molar. Shown on the left in centric relation and on the right in lateral excursion to the right

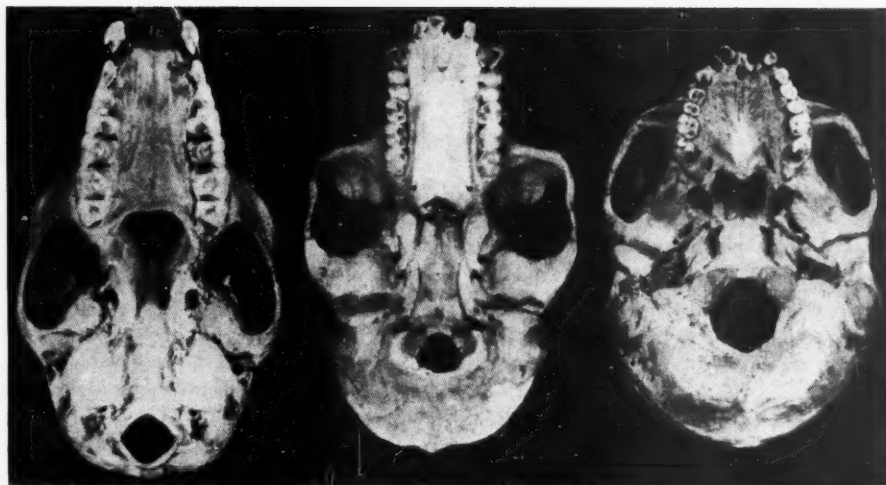


Figure 3 Bases of skulls of lemur, gorilla and *Homo sapiens* reduced to the same width to illustrate the gradual reduction of facial prognathism

nately, with occlusion on the two sides of the mouth balancing. The same pattern of chewing is also normal for men. The pattern of the wear facets found in the teeth of five human skulls was essentially the same as that seen in the gorilla.

Pitldown Man

Kenneth P. Oakley and J. S. Weiner.
Am. Scientist 43:573-583 Oct. 1955

The remarkable story of the Pitldown Man began in 1912 when Charles Dawson, a country solicitor and amateur scientist, brought some fragments of human skull bones, early animal teeth, and crude flint tools to the Natural History Museum in London. Later additional excavations in 1912 at the same site (Barkham Manor, Pitldown) uncovered a fragment of an apelike jawbone with two teeth, more bits of skull, fossilized animal teeth and bones, and ancient tools.

The interpretation of these findings has been a matter of controversy all of these years until, by scientific sleuthing, it was proved that the Pitldown Man is a hoax of the first water.

Some of the scientific evidence by which the mockery was detected included the following: (1) the fluorine dating method based on the fact that buried bones adsorb fluorine from the soil

and that the amount increases with time; the jawbone and brain case were much younger than the fossilized teeth; (2) chemical analysis confirmed that the jawbone contained the same amount of nitrogen and organic carbon as modern specimens; the brain case contained much less; (3) electron microscopy revealed perfectly preserved fibers of organic tissue in a decalcified sample of the jawbone; in the brain case all such organic fibers had disappeared, so the jaw was modern and, thus, was a bogus fossil; (4) additional scrutiny with the roentgen ray and the microscope revealed that apparently the teeth in the jawbone had been ground down artificially; (5) a roentgenogram of a cuspid (found separately from the jaw) showed it to have been ground off and the root canal filled with grains of a mineral and some type of cement; this tooth also contained a large amount of nitrogen, and the dark coating was an oil paint, probably Van Dyke brown; (6) spectrographic analysis and chemical tests showed that the flint instruments were artificially stained by chromium and iron-containing compounds; (7) proof that the elephant teeth were of foreign origin was determined by their relative radioactivity; (8) the skull fragments, some of the teeth, and the implements were also found to be stained artificially. As apatite in part had been changed to gypsum (cal-

cium sulfate) in the skull fragments, it was reasoned that a partially fossilized bone could be stained with an acid iron sulfate solution and change the apatite in part to gypsum. This proved to be so.

The foregoing, in combination with other tests, proved that the Piltdown Man was a scientific fantasy. The evidence points to the fact that the specimens on which the Piltdown Man was postulated were fraudulently introduced into the Piltdown gravel.



Psychology

The medical social worker as intermediary in some dental psychosomatic problems

Ernest Baker and Elsbeth D. Schwabacher.
J. California D.A. & Nevada D.Soc. 31:403-412
Nov.-Dec. 1955

The influence of the emotions on the cardiovascular system, blood pressure, respiration and the gastrointestinal tract has been demonstrated. Although many aspects of these interrelationships remain to be explored, it can be assumed that emotional strain and illness are only two phases of a single problem, neither of which can be dealt with effectively alone. Although numerous studies have explored the relationship of the emotional life to disease, little work regarding this relationship has been done in the field of dentistry.

A medical social worker was added to the staff of a private dental office to interview and consult with patients. Of 97 patients interviewed, 36 suffered from rampant dental caries, 26 had periodontal disease predominantly, 14 had both caries and periodontal disease, 10 had caries and 11, gingivitis. The study began in the fall of 1945 and continued for 18 months.

In almost 50 per cent of the patients, the patient's social relationships and his emotional life were disturbed by tensions of long standing. The observations suggest that consideration of the whole personality in its environment can aid in diagnosis, prevention and treatment in dental clinical practice.

Special attention was given to the temporal relations between the onset of dental illness and the times of emotional stresses and to the physical responses of different personalities to psychologic factors.

In most instances, knowledge and consideration of the patient's life situation and his interpersonal relationships were helpful to the dentist in dealing with the patient. The application of social casework methods in helping the patient find a more satisfactory form of social adjustment was an aid in the treatment of dental illness. Similarities in the personality profiles of patients with similar pathologic conditions could be demonstrated tentatively.

Those with a "caries personality structure" tend to be independent, to identify with the dominant parent figure, to be perfectionists, to have a need to exercise authority and to resent subjection to others. Those with a "periodontal personality structure" tend to have a need for dependency, to have a close attachment to the mother figure, to feel frustrated in their ambitions, to have strong feelings of family responsibility, to repress their hostilities, to fail to adjust adequately in their work, and to fall under the influence of dominating people.

Nine case histories illustrate the observations of this study.

Hypnotherapy and narcotherapy

Irwin Rothman. *J. Am. Osteopath. A.* 5:306-309
Jan. 1956

Hypnotherapy is becoming more acceptable, although there is still prejudice against hypnosis as a therapeutic aid. One should speak of therapy through hypnosis rather than therapy by hypnosis; the important interpersonal relationships of the patient and what hypnotism means to him must be taken into account.

Hypnotism is a natural biophysiologic phenomenon which is as universal phylogenetically as sleep. Not only all lower animals but almost all persons can be hypnotized, just as almost all would respond to an injection of amobarbital.

Many new hypnotherapeutic techniques are helping to make this form of therapy more acceptable.

Among the newer hypnotherapeutic technics are the following:

Regression—Hypnotic subjects are capable of simulating behavior at a suggested regressed age much better than are conscious subjects. They can recall things at these earlier age levels that they cannot recall at adult levels.

Revivification—Revivification involves having the patient dramatically relive some experience. Often the therapist plays the role of a reassuring friend or a parent or parent-surrogate.

Experimental conflict—A short-term experimental neurosis is used to create the patient's somatic symptoms, either under hypnosis or posthypnotically, by eliciting in him the emotions which are the suspected cause of the somatic symptoms.

Dreaming by request—The patient, while under hypnosis, is asked to have a dream about some particular problem. This speeds up any therapeutic approaches which utilize dream interpretation.

Automatic writing—The patient's hand is taught to write without his being aware of it. For a blocked or silent patient this can be a valuable technic.

Blackboard writing—The patient is asked to visualize a blackboard with chalk poised on it ready to write, and to report what the imaginary chalk writes.

Theater visualization—The patient is asked to visualize himself in a theater and watch the players on the stage and report their actions and appearance.

Autohypnosis—Autohypnosis is a useful adjunct in later treatment in reconditionings, experimental dream induction, and helping to break any dependency aspect of the relationship with the therapist.

Intensification of emotions—The intensification of emotions can be effective in the patient whose emotions are flat or whose defense has been isolation or intellectualism.

Interpretation of the hypnotic relationship—The tactful and timed interpretation of the interpersonal relationship with the hypnotist can be a rapid equivalent to the analysis of the transference in orthodox psychoanalytic procedures.

Hypnotic reproduction of symptoms—The symptoms may be duplicated under hypnosis; later the patient is taught to duplicate them un-

der autohypnosis. Then he can be told that if he can produce them he can also remove them.

Hypnotic substitution of symptoms—A patient with hysterical muscular weakness of an arm was taught to transfer this weakness to the little finger of the same hand.

Free association under hypnosis—Often, free association is less inhibited and more fruitful than it is in the waking state.

Group hypnotherapy—Many conditions, such as stammering, can be treated in a group.

Desensitization—Desensitization is similar to biologic immunization by increased doses of a vaccine or allergen.

Imaginary therapist—The patient visualizes the therapist and talks to him, and the imaginary therapist asks questions and interprets.

Combined hypnotism and narcotherapy—Hypnotism used in combination with amobarbital intravenously and with mixtures of amobarbital and methamphetamine intravenously has been gratifying therapeutically.

A case report illustrates some of these methods.



Microbiology

Aspects of medical problems in dentistry

George M. Eisenberg. *Pennsylvania D.J.* 23:9-11 March 1956

Only within recent years has the potential pathogenicity of the indigenous flora and its relation to the well-being of mankind come under close scrutiny. Disturbances of the normal ecologic balance within the indigenous flora, caused by the use of the sulfonamides and antibiotics, often result in effects that are distressing, and on occasion even disastrous. Among the microorganisms that make up the indigenous flora in man are lactobacilli, spirochetes, anaerobic micrococci, and other taxonomic groups which include frank pathogens.

Under proper conditions the indigenous flora can play a significant part in disease processes. Some of the so-called normal microorganisms may be antagonistic to recognized pathogens and prevent the latter from gaining a foothold.

Although the presence of the indigenous flora is not essential for the continued life of its host, germ-free rearing experiments have shown that the absence of such a flora renders the host susceptible to such common innocuous saprophytes as *Bacillus subtilis*. There is some evidence that the vitamin requirements of the host are supplied, at least in part, as a result of the activities of the flora.

Among the adverse effects observed in man after the use of antibiotics are diarrhea, diverse lesions of the mucous membranes, and superinfections caused by drug-resistant organisms. The mechanisms whereby these adverse effects are produced are not known in detail. Some of the symptomatology resembles that of vitamin deficiencies, specifically of the vitamin B group.

As suggested by Dubos, recognition and identification of the metabolic factors which permit individuals to harbor, without manifestation of disease, microorganisms which are potentially pathogenic, may reveal a new phase of the germ theory. It may be possible to design techniques of metabolic control which would help man to live at peace with microbial parasites, which, after all, constitute an inescapable part of his biologic environment.



Histology

Pulp reactions to ultrasonic tooth preparation

Joel Friedman, Theodore Lite and Harold Solomon. *New York J.Den.* 26:144-148
April 1956

A controlled investigation of the effects of cavity preparation with the ultrasonic drill on animal dental pulps was carried out. Young adult monkeys (*Macaca mulatta*) were chosen because of the similarity of their dentition to that of humans. On the first monkey, three teeth were prepared on the right side of the mouth with the ultrasonic drill, and on the left side three preparations were made on the comparable teeth with burs at about

3,000 rpm, under water. Routine occlusal cavity preparations were made on the posterior teeth, and labiocervical preparations on the anterior teeth.

On the second monkey the same three pairs of preparations were completed; in addition, both upper central incisors were cut off at the incisal edge to expose 1 mm. of dentin, simulating a crown preparation cut. All the teeth operated on were permanent teeth, free of caries or fractured cusps. All the operative procedures were completed on each monkey in one session.

After extraction, the teeth were decalcified, and paraffin sections were stained. The teeth were examined for the effects on the three major tissues of the pulp—the odontoblastic layer, pulpal vascular tissues, and pulp connective tissue. An unprepared tooth was extracted from each animal to serve as a standard for pulpal inflammation resulting from extraction trauma.

The majority of the teeth showed no more than scant inflammatory reaction, of a degree associated with the trauma of luxation incident to extraction. No sign of acute involvement or necrosis attributable to cavity preparation by rotary or ultrasonic devices was found.

Of the 16 teeth examined, the changes in the pulps prepared with the ultrasonic technic were consistently parallel to the pulpal picture in teeth after the use of rotary tools. Most of the changes were a slightly increased congestion of blood vessels and edema in the connective tissues.

This experiment makes apparent the need for controlled studies on bilateral pairs of recently erupted caries-free human teeth (orthodontically condemned).

A method of preparing ground sections for microradiography and autoradiography

Erna Hammarlund-Essler. *Acta odont.scandinav.* 13:167-179 Nov. 1955

The introduction of methyl methacrylate as an embedding medium has improved the possibility of grinding thin sections from specimens consisting of a combination of soft and hard tissues without impairing the soft tissues or displacing them in relation to the hard tissues.

Specimens were fixed in 10 per cent neutral buffered Formalin, dehydrated in ascending grades of alcohol, embedded in methyl methacrylate and cut into serial sections 400 to 600 microns thick by a rotating diamond saw.

These sections were attached to plane glass specimen carriers (cleaned 9 by 12 cm. photographic plates) by double-coated Scotch Tape. A rubber suction cup was used as a holder on the other surface of the carrier. Dry grinding under gentle pressure was performed on resin bonded silicon carbide abrasive papers no. 120, 240 and 600, attached to a plane rotating disk by double-coated Scotch Tape. Finishing was done with emery paper no. 0000, after which the sections were removed from the carrier by immersion in benzene, dried and attached with the finished side facing the carrier for grinding of the other side.

The grinding apparatus was constructed from an electric household machine by modifying metal mixing bowls into turntable and collecting tray, in an arrangement similar to low-speed metallographic polishers. A dust shield of transparent polyethylene was employed, and when radioactive specimens were being ground, the hand was protected by a rubber glove.

Other abrasives can be used for wet or dry grinding, including etched or sand-blasted plate glass disks with or without abrasive powders.

By the dry method described, ground sections 50 microns thick are readily obtainable and in many instances still thinner sections have been obtained without fracturing the dental enamel.

The influence of chronic inflammatory processes in the periodontium of deciduous teeth on the development of the permanent dentition

(Vliyanie chronitsheskogo vospalitel'nogo protsessa v periodonte molotshnykh subov na formirovanie satshatkov postojannykh subov)

I. M. Pejsachobitch and O. V. Pretrova.
Stomat., Moscow 4:7-10 July-Aug. 1955

The resorption in deciduous teeth begins either in the root apex and progresses to the tooth crowns or proceeds in the reverse direction. In the region

of resorption, a granulation process occurs above the crowns of the still unerupted permanent teeth. When a permanent tooth erupts in buccal or lingual position, the covering granulated tissue promotes the resorption and normal loss of the deciduous tooth. When the eruption of the permanent tooth occurs at a distance from the deciduous tooth, however, no such resorption takes place.

The influence of inflammatory processes in the periodontium of the deciduous teeth on the development of the permanent dentition was the subject of a study made by the staff of the Dental Institute of the University of Moscow.

Twelve dogs, two months old, were used in this experiment. The deciduous teeth were opened but the cavities were not sealed. Within two days after opening, acute pulpitis and periodontitis developed. The dogs were sacrificed on different days, and sections of their jaws prepared as specimens for histologic examination.

Different types of inflammatory processes were observed, accompanied either by an intensive cell filtration or by tissue infiltration, others by a transformation of connective tissue to granulated tissue. When the inflammations were limited to the pulp, a demarkation wall but no newly formed connective tissue was observed. When the infection was localized in the periodontium, however, new connective tissue appeared adjacent to the dental sacs.

The granulation between the roots of the deciduous teeth and the crowns of the gradually erupting permanent teeth consisted of new plethoric tissue. In the European dental literature, this type of granulation is termed "resorption organ" (Eichler). The origin of this resorption organ, however, has not been established up to the present.

Inflammation in the periodontium of deciduous teeth, caused either by traumas or toxoinfection, may lead to lesions in the resorption organ. The granulated tissue protects the dental germs against injuries. Sometimes this defensive reaction can have contrary effects; the granulated tissue may be transformed into compact connective tissue which can impede tooth eruption. A vicious circle then exists which may lead to the retention of permanent teeth and to formation of follicular cysts.

Pathology

Abscesses and phlegmons of the tongue

(Die Abszesse und Phlegmonen der Zunge)

P. Hennion and J. F. Laroche. *Deut.Zahnärztebl.* 9:789-799 Nov. 8, 1955

Abscesses and phlegmons on the tongue are comparatively rare. Such conditions, however, usually become rapidly worse.

Etiologically, the causative factors are: traumas from carious or fractured teeth; injuries by dental instruments; insect bites; inflammatory processes in the oral cavity; fractures of the mandible; scarlet fever, influenza, septicemia, variola and stomatitis. Causative microorganisms are streptococci, staphylococci, pneumococci, spirilla (pseudomonas) and anaerobes.

Abscesses on the tip of the tongue begin with pain, fever, enlargement of the tongue, speech defects and increased salivation. All inflammatory symptoms increase for from 24 to 48 hours, and the pain radiates to the neighboring regions. Dilatation usually occurs, unless surgically treated, within from five to six days.

Phlegmons on the base of the tongue usually start with vague disturbances such as fever, pharyngeal spasms, quick pulse, loss of appetite and a feeling of tiredness. They occur especially after inflammation in the vicinity of the base of the tongue that had been caused by tonsilitis or infected third molars. After two days, the swelling, beginning at the base, involves the whole tongue. Pain becomes intolerable, and the intake of food is impossible. The patient keeps his mouth wide open, his speech is hardly comprehensible, and halitosis and trismus occur.

The main symptom of these phlegmons is the total fixation of the tongue. An extension of the disease into the regions of the epiglottis and the larynx causes the development of edemas. The cervical region and the lymph glands also may be involved in the inflammatory process. If surgical intervention is not undertaken, edemas of

the respiratory glottis or phlegmonous infiltrations of the laryngeal region make an immediate tracheotomy necessary, lest sepsis or bronchopneumonia lead to death.

Clinically, three types of phlegmons can be distinguished: (1) the diffuse phlegmon of the tongue, appearing after severe infections in debilitated patients with diabetes or tuberculosis or after mercury treatments, causing gangrene without suppuration; (2) the mediolingual phlegmon with symptoms resembling both erysipelas and carbuncles, and chronic cellulitis of the floor of the mouth and in the neck; and (3) hemiglossitis, characterized by edema and an inflammation of a lateral half of the tongue, caused by bacterial infections.

Anatomicopathologically, an intramuscular infiltration by lymphocytes in all types of phlegmons is evident. The acute hemiglossitis originates in the sublingual gland, the floor of the mouth or in the periodontal tissue. A more chronic form is cellulitis resembling a diffuse epithelioma.

The treatment of phlegmons of the tongue consists in incision of the abscess, elimination of the accumulation of pus, and the administration of high doses of antibiotics.

In an emergency, tracheostomy or tracheotomy should be performed immediately.

The evaluation and management of oral leukoplakia

John F. Latenser. *Chron.Omaha Dist.D.Soc.* 19:201-205 March 1956

Sandstead and Lowe (1953) evolved a simple classification of leukoplakial lesions that is helpful in deciding which lesion is precancerous and in selecting proper treatment. Three related leukoplakial conditions—leukoplakia, keratosis and "leukoedema"—appear as white patches in the mouth.

The majority of white patches found in the mouth are leukoedema. The term "leukoedema" is not yet accepted by pathologists but is helpful in distinguishing between types of leukoplakia. Leukoedema occurs in several degrees of severity. In the mildest instances the mucosa is seen to be slightly thickened and faintly whitened or opales-

cent. The normally visible capillary network is obliterated. The filmy white change in the mucosa is so faint as to disappear on stretching. The lateral and the posterior cheeks are the sites most frequently involved. More advanced instances display a white or grayish-white, coarsely granular mucosa which is not affected by stretching. In advanced leukoedema the whitened areas are thickened and may be shaggy or leathery. They may be wet or dry.

Keratosis usually are seen at the commissures where drying occurs. These mucosal lesions are dry, thickened and crinkled, and vary in color from normal pink to areas of brownish or grayish discoloration. Erosions may be present. Keratosis also may be found in the mouth at points of chronic irritation adjacent to sharp or roughened teeth, ill-fitting dentures or in the part of the mouth where a tobacco chewer habitually holds his quids. White patches of "leukoplakia" encountered in these circumstances are often found microscopically to be keratosis.

Leukoedema appears from an unknown cause, perhaps from some dietary, metabolic or mechanical basis. An area of leukoedema submitted to chronic irritation is more prone to develop a keratosis than is normal mucosa. Continued irritation presumably produces a true leukoplakia in a few instances. Leukoplakias differ from leukoedema in that the former have a prominent granular cell layer and a definite keratinized surface layer with practically no detectable nuclei. The several varieties of leukoplakia include the many types of stomatitis and the oral manifestations of syphilis, mycoses, psoriasis, lichen planus and white sponge nevus.

Sandstead and Lowe reported that white plaques of leukoedema occurred in varying severity in 58 per cent of 646 patients. Keratosis were found in 14 per cent of the patients, and white plaques which clinically appeared to be leukoplakia were present in 6.8 per cent. Biopsy showed that half of these (3.4 per cent) were true leukoplakia; the remainder were leukoedema.

Initially, simple measures are recommended in the treatment of leukoplakia: high vitamin intake; mild alkaline mouthwashes such as sodium bicarbonate; avoidance of tobacco and removal of the sources of chronic irritation. In one series

50 per cent of the "white plaques" disappeared after massive doses of brewer's yeast. If leukoplakial areas which are thus treated persist for six months, surgical excision or fulguration is indicated. Follow-up is resumed at monthly intervals for an additional six months.

Agents no longer recommended for treatment include roentgen ray, radium, dry ice and silver nitrate. A biopsy should be taken of the obviously advanced instance of leukoplakia.

Oral cancer accounts for 15 per cent of all cancer. Leukoplakia contributes importantly to this group. Martin reported that approximately 60 per cent of patients with cancer of the gingiva consulted a dentist first. This stresses the role the dentist plays in early diagnosis. Success or failure of treatment hinges in great part on whether the lesion is treated early or late.

The mouth and its diseases

Kurt H. Thoma. *M.Clin.North America*
40:291-315 March 1956

This article is part of a symposium on diseases of the digestive tract. The observation includes: (1) developmental anomalies, such as lip cleft, palatal clefts, tongue clefts, abnormal labial and lingual frenums with ankyloglossia; (2) functional anomalies, such as temporomandibular ankylosis and arthrosis; (3) bacteriology of the mouth: the original flora in the newborn, the mouth flora of the adult, and different microorganisms inhabiting the normal and diseased mouth; (4) diseases of the teeth and their surrounding tissues, including hypertrophic and hemorrhagic diseases of the gingiva, nutritional deficiencies, different types of stomatitis, such as stomatitis nicotina, venenata, medicamentosa, herpetic, necrotizing ulcerative, gangrenous; and other lesions, such as moniliasis, syphilis, pemphigus, erythema multiforme, lupus erythematosus, and the diseases affecting principally the tongue; and (5) the tumors of the mouth, benign and malignant, and the tumors of the salivary glands.

Therapeutic treatments and surgical interferences, orthodontic and prosthetic appliances are discussed. Several diagnostic photographic pictures and a microphotograph are presented.

Armamentarium



Equipment

Soldering stainless steel springs

B. C. Leighton. *European Orthodont. Soc. Tr.*
p. 341-342, 1955

Since the introduction of stainless steel for fixed orthodontic appliances, much ingenuity has been shown in overcoming the problem of attaching springs to the appliance.

A few years ago an electric machine for soldering stainless steel was marketed. This machine transforms the main electric supply to a current of sufficiently high amperage to cause heating of a piece of stainless steel wire through which it is passed. By this means solder and flux may be fused on the wire without the use of the flame. The technic has been used in other fields for some time.

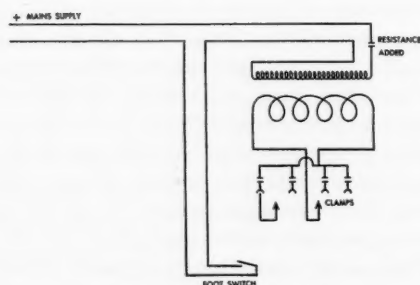


Figure 1 Wiring plan to show additions made to existing circuit

A foot switch is added to the primary circuit of the transformer (Fig. 1). The secondary circuit is passed through a section of the thicker wire to be soldered (the arch wire), which is clipped into two clamps; these are connected to the terminals of the secondary circuit. The machine has four positive terminals of varying amplitude. A resistance coil is added to the primary circuit to obtain the ideal strength of current.

A loop of solder is pinched onto the thicker wire (usually 1.0 mm. round arch wire) at the site of attachment, which is smeared thinly with flux. The arch wire is screwed into the clamps which are placed one on each side of the site of attachment, as near to it as is convenient (Fig. 2). This section of wire is to be heated and will therefore be softened. The softening of a rigid arch wire is of no importance as long as the wire is sufficiently thick to withstand whatever forces are brought to bear on it. The spring wire is thinly smeared with flux. The current is turned on by depressing the foot switch, and this causes the flux and solder to fuse. As soon as this occurs, the foot switch is released and the spring wire is laid into the fused solder. Sufficient heat remains in the solder to fuse it to the spring without destroying the properties of the latter. The root of the spring should be enveloped in a tapering sleeve of solder. The appliance may then be boiled in alum to remove the flux, smoothed and polished, and the spring bent to shape.

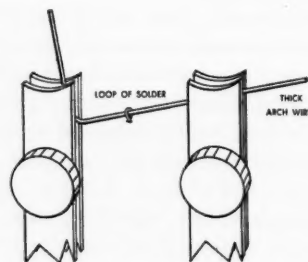


Figure 2 Arch wire clamped in terminals ready for soldering



Therapeutics

What's new in medical dentistry

Irving G. Nathanson. *Massachusetts D.Soc.J.*
4:11-13 Oct. 1955

In previous years, for patients under treatment for hypertension or cardiac disease, the use of a local anesthetic with epinephrine was not recommended. The American Heart Association now recommends the use of a local anesthetic with epinephrine, unless contraindicated by previous idiosyncrasy to the particular anesthetic. Epinephrine concentration should be in the vicinity of 1:100,000 to 1:125,000. A maximum of three cartridges for any procedure should be well within the safety margin.

A patient who states that he is allergic to procaine (Novocain) usually means that he is sensitive to para-aminobenzoic acid derivatives. To circumvent untoward reactions, such patients should be given nonpara-aminobenzoic acid local anesthetics, such as lidocaine hydrochloride or butethamine hydrochloride.

Patients with a clinical diagnosis of aphthous lesions, herpetic stomatitis and herpangina respond successfully to dosages of B complex with vitamin C.

Infectious mononucleosis is a systemic disease in which the dentist may be the first to be consulted. It may manifest itself by herpetic stomatitis associated with submandibular, cervical or axillary adenopathy. Patients placed on a multivitamin regimen show an improvement. The oral lesions become less painful and within 48 hours show signs of healing.

Elixir of B₁₂ in doses of 50 to 100 micrograms once daily in orange juice is of value in the delayed eruption of teeth.

Antihistamines are recommended for the prevention of edema resulting from surgical trauma and for premedication.

A tablet of promethazine hydrochloride (12.5 mg.) dissolved in 1 cc. of water forms a potent

topical anesthetic prior to injection, or it may be applied to aphthous or herpetic lesions for the relief of pain. If two tablets are dissolved in a half glass of water and used as a mouthwash or gargle, gagging reflexes are reduced. Promethazine hydrochloride is of value in roentgenographic procedures or in prosthetics where palatal or lingual sensitivity is a problem. Antihistamines possess antifungicidal and antibacterial properties and have been recommended as an irrigating agent in root canal therapy. In instances where general anesthesia is indicated, the preoperative use of the antihistamines apparently reduces the incidence of postoperative nausea and allows a more rapid and relaxed administration of anesthetic.

A new drug, carbazochrome salicylate, available for injection and in tablet form, is an aid in controlling primary and secondary hemorrhage. Preliminary evaluation shows this agent to be effective in controlling bleeding of the capillary or oozing type. In those instances where excessive bleeding is anticipated, as in alveoloplasties and gingivectomies, preoperative medication 24 hours prior to surgery provides a remarkably avascular field.

The acceptance of a Formalin dentifrice

Melvin H. Amler. *New York D.J.* 22:64-65
Feb. 1956

The unfortunate concept of teeth as inorganic blocks, anatomically located in the oral cavity but not actually part of the living body, is the basis of many of the new dentifrices and mouthwashes recently presented to the public.

The proponents of a dentifrice containing Formalin claim that the surface organic substance of the dentinal tubule combines with the Formalin to form an insoluble material which acts to bar the fluids of the mouth. They further claim that when the depth of coagulation required is achieved, hyperesthesia of the dentin is relieved and additional exposure of the internal substance of the dentinal tubules to oral fluids is prevented.

Bodecker has suggested that a concentration of at least 10 per cent Formalin would be necessary for topical application to be effective in reducing "sensitive necks" of teeth; and, on the other hand,

if any but infinitesimal concentrations of Formalin are incorporated in a dentifrice or mouthwash, the entire oral mucosa would be cauterized.

Actually, there is no logical basis for the assumption that coagulation and consequent death of living protoplasm will act as a barrier to oral fluids; the opposite appears to be true.

Clinically, it would be desirable to decrease the permeability of the dentin in order to diminish pulpal reaction to external stimuli and to lessen the possibility of recurrent decay, but teeth must not be thought of as inorganic blocks. The pulp is an end circulatory organ and is readily affected by disturbances involving the terminal vessels. The dentin has been shown, by means of dyes and radioactive isotopes, to be permeable to practically every medicament used in dentistry.

The clinical action of Formalin in sometimes lessening the sensitivity of exposed dentin may be caused by its poisoning effect in lessening pulp vitality. It is still an open question whether the possibly reduced permeability or the partial destruction of the fiber eliminates the sensitivity.

In the hands of the qualified dental practitioner the use of Formalin in instances of extreme hypersensitivity might be justified, although further extensive investigations as to its exact physiologic action on the dentin and pulp are indicated. The incorporation of Formalin in a dentifrice or mouthwash for the public to use indiscriminately is ill-advised.

Antimicrobial therapy in the practice of dentistry

Harrison F. Flippin. *Pennsylvania D.J.* 23:2-8
March 1956

The recent prodigious advances in the field of anti-infective agents has influenced profoundly the practice of dentistry. Therapeutically, antimicrobial agents are being used successfully in root canal sterilizations and in treating such infections as necrotic pulps, abscesses, cellulitis, Vincent's angina, maxillary osteitis and mandibular osteomyelitis. Prophylactically they are employed primarily in connection with the extraction of teeth, or other oral manipulation, to prevent

subacute bacterial endocarditis in patients with valvular heart disease, and as preventive agents when maxillofacial surgery is performed.

Administration of antimicrobial agents, however, has resulted in certain undesirable consequences which constitute new and serious problems in dental practice. The widespread and indiscriminate use of these agents has resulted in an increase in the number of drug-resistant bacteria. Microorganisms usually regarded as non-pathogenic have caused infections during antibiotic therapy. Toxic reactions to these therapeutic agents have increased.

Until such time as an ideal chemotherapeutic agent is developed, the oral surgeon should limit the use of these lifesaving agents to diseases in which their therapeutic effectiveness has been demonstrated. He should refrain from employing these drugs prophylactically except when the complication to be avoided is serious and one which occurs frequently in the absence of precautions.

Penicillin heads the list of medicinal agents in the frequency, diversity and severity of the sensitivities it produces. Nevertheless, penicillin remains the least toxic of the currently available antimicrobial agents. Its established therapeutic value and relatively low cost combine to establish it as the most popular drug. When reactions do occur and are not too severe, treatment usually can be continued with the aid of anti-allergic remedies.

Chlortetracycline, oxytetracycline and tetracycline frequently give rise to gastrointestinal and genitourinary disorders. When these drugs are used for periods exceeding seven days, the patient should receive buttermilk, vitamin B complex and B₁₂ orally. If toxicity develops, the drug should be discontinued, if possible, and injections of crude liver or B₁₂ given daily.

The severity of toxicity from streptomycin and dihydrostreptomycin is dependent on the duration of therapy, total dose employed, and degree of renal impairment. The principal toxic effect is damage to the eighth nerve and vestibular apparatus. The recent practice of employing mixtures of these two drugs has reduced substantially the toxic effect.

Chloramphenicol gives rise to the same toxic reactions as the tetracycline group, and in addi-

tion exerts at times a toxic effect on the hemopoietic system.

The only undesirable effect noted in patients treated with erythromycin has been an occasional gastrointestinal upset.

Although polymyxin B sulfate is considerably toxic, its unique effectiveness in infections caused by *Pseudomonas aeruginosa* has justified its clinical use. Careful observation for renal damage is essential to its safe administration.

Since the parenteral administration of bacitracin is often followed by kidney damage, and since only a small amount is absorbed when given by mouth, this drug finds its chief usefulness as a topical or oral medicament.

A variety of untoward reactions may follow administration of the sulfonamides.

Prescription writing

Preston C. Wheeler. *J. Oklahoma D.A.* 44:31-33 April 1956

A prescription is a written order to the pharmacist by a dentist or physician for the preparation and administration of a remedy. Too many dentists do not write prescriptions, but depend on proprietary remedies the exact formula or nature of which they do not know. This empiricism indicates a lack of knowledge by the practitioner of the fundamental sciences of pharmacology and materia medica.

The dentist who does not take advantage of modern drugs in his practice is not giving his patient the service to which he is entitled. Drugs should be used as an adjunct to accepted dental procedures, to reduce systemic toxicity, to prevent postoperative sequelae, to shorten healing time, to reduce postoperative pain and to reduce preoperative anxiety.

The average dental practitioner fears that an improperly written prescription may make him subject to criticism. He lacks confidence in his ability to choose and combine the drugs necessary for the therapeutic action desired, and he fears that the pharmacist will not understand his prescription because it is poorly written.

A prescription has the following five parts: (1) the superscription or heading, including the

name of the patient, his address and the date; (2) the inscription or names and qualities of the drugs to be prescribed; (3) the subscription or directions to the pharmacist; (4) the signa or directions to the patient, and (5) the signature, including the name of the prescribing doctor, degree, and, if the drug is a narcotic, the doctor's address and registry number.

Prescriptions should be written neatly and legibly on a regular pad provided for the purpose.

Oral prescriptions to the pharmacist over the telephone now are acceptable; otherwise, the new federal law and regulations do not change the responsibilities of dentists, physicians and pharmacists in prescribing and handling narcotic preparations.

Under the new federal law the following narcotic preparations can be sold or dispensed on oral prescriptions: codeine compounded with one or more nonnarcotic ingredients; dihydrocodeinone when similarly compounded; ethyl morphine hydrochloride when compounded; any isoquinoline alkaloid of opium; apomorphine or any salt thereof, and nalline or any salt thereof.

Reaction of odontoblasts to medicaments placed in cavity preparations in rat incisors

J. Georges Perreault, Maury Massler and Isaac Schour. *J.A.D.A.* 52:533-554 May 1956

The relative effects on the pulp of a number of sterilizing and chemical agents commonly used in dentistry were investigated by applying these medicaments to cavities prepared in the incisors of 188 rats for ten minutes.

The results, presented tabularly, show that:

1. The deeper the cavity preparation, the greater are the effects of the operative trauma and the medicaments on the odontoblasts and the pulp. The calcio-traumatic reaction is accentuated when the cavity floor reaches a critical level approximately 50 microns from the pulp. Severe injury to the odontoblasts as evidenced by dentin hypoplasia resulted when the floor of the cavity came within 25 microns from the pulp.

2. Eugenol, thymol, eucalyptol, beechwood creosote, chloroform, acrylic monomer, hydrogen

peroxide 4 per cent, and benzalkonium chloride 1:1,000 produced little or no additional injury to the odontoblasts or the pulp when these were applied for ten minutes or less, even in deep cavity preparations. In this group, differences in odontoblastic reactions were determined by differences in cavity depth rather than by different medicaments.

3. Alcohol 95 per cent, sodium fluoride 4 per cent and sodium silicofluoride 0.9 per cent caused a slight injury to the odontoblasts when applied under the same conditions, in deep cavity preparations. No effects were observed in shallow cavity preparations. None of these substances penetrated to or injured the pulp under the odontoblasts even when applied in very deep cavities.

4. Phenol and phenol compound produced a moderately acute reaction when applied for ten minutes to medium cavities and a more severe injury to the odontoblasts in very deep cavities. Phenol, however, did not penetrate into nor produce a destructive reaction in the pulp itself.

5. The action of most of the medicaments investigated was more severe (to different degrees) when they were sealed into the cavities for two or three days, but even then destructive effects on the pulp were not produced.

6. Since the dentin of the rat incisor is more permeable than human dentin and since the sensitivity of the rapidly growing dentin-forming cells far exceeds the sensitivity of the same type of cells in the human pulp, the application of these medicaments and chemical agents to freshly cut human dentin for ten minutes or less should produce no significant injury to the pulp or its cells even in deep cavity preparations.

7. Orthophosphoric acid and silver nitrate produced destructive reactions in the pulp. Orthophosphoric acid produced hypoplasia in medium cavities, aplasia in deep cavities and destruction of the pulp (inflammation and abscess formation) under very deep cavities. Silver nitrate produced hypoplasia even in shallow cavities and complete death of cells in pulpal necrosis under medium and deep cavities.

8. In view of the destructive action of silver nitrate on the pulp, its use in clinical dentistry for the sterilization of dentin in deep carious lesions should be questioned.

Antibiotic lozenges for buccal and pharyngeal infections

Brit.M.J. No. 4968:699 March 24, 1956

Q.—Have lozenges any beneficial effect in infections of the mouth and throat? Are antibiotics used in this manner of any value? Penicillin and tyrothricin lozenges seem to be very much in vogue at present.

A.—Any effective sustained concentration of an antibiotic given in the form of a lozenge is likely to be confined to the tongue and palate, so that this method of administration is of limited value if the infection lies further back than the anterior pillars of the fauces. Penicillin lozenges, given for any length of time, not uncommonly produce "black tongue" or glossitis, and less frequently stomatitis, erythema of the palate and pharynx, or cheilitis. Tyrothricin lozenges, which contain benzocaine, owe most of their beneficial effect to their soothing properties rather than to their antibiotic effect. Infections of the mouth or pharynx of sufficient severity to require antibiotic treatment will be inadequately controlled by lozenges. Many infections, of course, resolve while such lozenges are being taken, but in all probability these were self-limiting infections and no antibiotic therapy was in fact required.



Instruments

A new instrument for root extirpation (Ein neues Gerät zur Wurzelextraktion)

Hugo Ackermann, Lucerne, Switzerland.
Zahnärztl.Praxis 7:2-3. Feb. 15, 1956

Recently, an instrument for root extirpation has been introduced which permits easier lifting of tooth fragments and roots from the alveolus without injuring the surrounding tissues. The extirpation of even the most complicated roots now can be accomplished in the shortest time possible without surgery.

The instrument consists of the following: (1) several extraction screws; (2) specially designed

root canal obturators and (3) curved levers which fit the course of the individual root canal. The cone of each extraction screw has a sharp thread which corresponds to that of the obturator. In proper root canal preparation, the thread of the screw (in its whole length) should be placed close to the root canal which is prepared in the shape of a cone. The form and size of the extraction screw allow preparation even in the deeper regions of the root canal; if necessary, in the root apex. Such a deep preparation is indicated when the root is decomposed or when the entrance to the root canal has to be enlarged greatly.

A curved lever is attached to a customary reamer with bolts at an expedient height. Each extraction screw has two bolts (one above the other); they also can be attached to the apparatus. An axial pull can be exerted toward the root to extirpate teeth, tooth fragments or roots in both jaws.

If complications are expected before extirpation, especially in completely decayed roots, customary forceps and single-arm levers will not be sufficient. Hemorrhage may occur and prevent fast and uninterrupted work.

Root canals should be shaped round, tapering and with minimal apical openings and later filled with either the single or the multiple cone technique. Cones are prepared with root canal burs which have reduced shafts. Their points should be placed deep in the canal entrance; the end of the screw will stop further advance and prevent the threads from damaging the walls of the root canal. The lever should be moved over the head of the screw. The condition determines whether the tooth should be protected by a wooden support before the pulling force is exerted.

In endodontics, freeing the root canal from all obstacles is as important as the correct canal preparation, sterilization and obturation.

The utilization of the new instrument for root extirpation, however, can lead to failure in the following circumstances:

1. When extraction screws are turned with too much force or if the levers are too long and incorrectly curved, a vertical fracture of the root may occur.
2. When a root canal is enlarged to its apex in cylindrical form, root extirpation will not only be

complicated and difficult but the subsequent filling probably will be inadequate.

3. When the curved lever exerts an unbalanced force, screws may break.

4. When the cavity is extended to the sides or the apex of the tooth, the screw may adhere to the bone.

5. When the root canal is enlarged with a cone which does not correspond to the cone of the screw, the instrument cannot sit tightly and the threads will not cut uniformly, thereby breaking off many parts of the threads.

With this instrument, however, it is possible to split a tooth root along its vertical axis. This is important in the complicated extraction of misplaced third molars because it is easier to eliminate smaller fragments immediately and then later the main part by turning and tilting. After the remaining part becomes loose, it can be extracted easily with either forceps or extraction screws.



Miscellaneous

Evaluation of dental operative devices

Joel Friedman. *New York D.J.* 22:193-198
May 1956

The dental profession should establish an orderly procedure for evaluating new dental operative devices. A national policy-making body of interested, qualified dentists should be formed and assigned the following functions: (1) to initiate a procedure for reviewing requests from volunteer investigators who wish to participate in the evaluation program; (2) to arrange with the manufacturers for the provision and servicing of the experimental machines; (3) to set up minimum basic research requirements and (4) to prepare a framework for the formation of local study units so that members for the study program may be selected at the local level.

The scientific research program should have the dual objective of determining how well the tool can perform the required work and what are the potential dangers involved in its routine use.

Doctoral and Masters' dissertations



In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

An investigation of the angio-architecture and duct structure of the parotid and submandibular salivary glands in relation to surgery. *Harvey William Lyon*. 1956. PH.D. *Georgetown University*.

Effect of ultrasonic waves on the tissues of the jaws and teeth of the dog. *Milton Junior Knapp*. 1956. M.S. *Georgetown University*.

Some physico-chemical changes in the properties of agar type duplicating material and agar-agar on heating. *Peter Michael Margetis*. 1956 M.S. *Georgetown University*.

Serial determination of the calcium, phosphorus, nitrogen, and citric acid contents of enamel and dentin. *Samuel C. Peckham, Jr.* 1956. M.S. *Georgetown University*.

A clinical evaluation of hyaluronidase in oral surgery. *Thomas Smith Shuttee*. 1956. M.S. *Georgetown University*.

Determination of some compressive properties of human enamel and dentin. *John Walter Stanford*. 1956. M.S. *Georgetown University*.

A radiographic evaluation of the temporomandibular joint in edentulous subjects. *Sheldon William Rosenstein*. 1955. M.S.D. *Northwestern University*.

An electromyographical investigation of the functioning perioral and suprahyoid musculature in normal occlusion and malocclusion patients.

Leonard Schlossberg. 1955. M.S.D. *Northwestern University*.

A radiographic and clinical study of the positional relations of the condyles in individuals with excellent occlusion of the teeth and apparent normal function of the temporomandibular joints. *Edward Charles Schwartz*. 1955. M.S.D. *Northwestern University*.

A study of morphologic changes in the oral cavity induced by eccentric muscular activity in cerebral palsy children. *Gene S. Trausch*. 1955. M.S.D. *Northwestern University*.

Changes in the facial expressions of German composers (Wandlungen des Gesichtsausdruckes im Leben deutscher Musiker). *Ello Ahrens-Blanckart*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Chronaximetry, its theoretical principles and its utilization in dental practice as a method for the diagnosis of pulp diseases (Die Chronaxie, ihre Gesetzmässigkeit und ihre Anwendung in der zahnärztlichen Praxis zur Pulpitidiagnostik). *Heinz Priebe*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Ultrasonic therapy in dentistry (Erfahrungen mit Ultraschallbehandlung in der Zahnheilkunde). *Kurt Seiz*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Poor correlation between the arches of the jaws and the teeth, caused by functional disturbances (Korrelationsstörungen der Kiefer- und Zahnbogenform als Folge funktioneller Störungen). *Annelie Dorff*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

The relation between enamel and dentin in healthy and pathologically altered teeth as observed with the polariscope (Die Relation von Schmelz und Dentin bei gesunden und pathologisch veränderten Zähnen unter kritischer Beobachtung mit Hilfe des Polarisationsmikroskopes). *Siegfried Würker*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Is the saliva of dogs bactericidal? An investigation of W. E. Fish's theory (Ist Hundespeichel bakterizid? Zu den Versuchen von W. E. Fish aus dem Jahre 1934). *Werner Jupitz*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Sterilization of syringes with the "Citoclave" and "Elmeda" sterilizers (Die Spritzensterilisation unter besonderer Berücksichtigung des Klinik-Citoklaven und des Elmeda-Kleinststerilisatos). *Doris Zirkelbach*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

The problem of focal infection in children. (Zur Folge der Herdinfektion im Kindesalter). *Friedrich Carl Schaal*. 1953. DR.MED.DENT. *University of Bonn, Germany*.

Clinical examinations and animal experiments in regard to pulp condition after fillings with the autopolymerizing acrylic materials "Palavit" and "Dentafile," by consideration of the "Trepak" ester (Klinische und tierexperimentelle Untersuchungen über das Verhalten der Pulpa nach Füllungen mit den autopolymerisierenden Kunstharzen Palavit und Dentafile unter besonderer Berücksichtigung des Trepak-ester). *Joachim Posern*. 1953. DR.MED.DENT. *University of Mainz, Germany*.

Comparison between the width of the upper incisors and that of the lower incisors (Verhältnis der oberen zu den unteren Schneidezahnbreiten). *Margarete Hanuschke*. 1953. DR.MED.DENT. *University of Mainz, Germany*.

Blood-calcium level in dental focal infection and its changes according to the "Bettyan" test (Das Blutbild bei dental Herderkrankungen und seine Veränderungen nach dem Bettyan-Test). *Heribert Cannivé*. 1953. DR.MED.DENT. *University of Mainz, Germany*.

Experimental studies of dimensional and formal changes of the dies for indirect dental techniques. *Takao Fusayama*. 1954. D.M.SC. *Tokyo University*.

"Anencymia catalasea": a new type of constitutional abnormality. *Masaru Yoshiya*. 1954. D.M.SC. *Nippon Medical College*.

A generative process underlying the pain sensory mechanism in man and a contribution to the problem of double pain. *Kikuji Konishi*. 1955. D.M.SC. *Tokyo University*.

A single spike discharge evoked by natural stimulus of the stretch-afferent nerve fibre of the frog. *Tsutomu Kondo*. 1955. D.M.SC. *Tokyo University*.

Observation of the so-called cuneiform defect of the tooth. *Shinichi Miura*. 1955. D.M.SC. *Tokyo University*.

A cytologic study of the pleomorphism of oral lactobacilli by exposure to several chemical agents. *Natsuo Arihisa*. 1955. D.M.SC. *Tokyo Medical and Dental University*.

Study of *Tetragenae* and *Sarcinae* recovered from the oral cavity. *Hisashi Fujita*. 1954. D.M.SC. *Tokyo Medical and Dental University*.

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